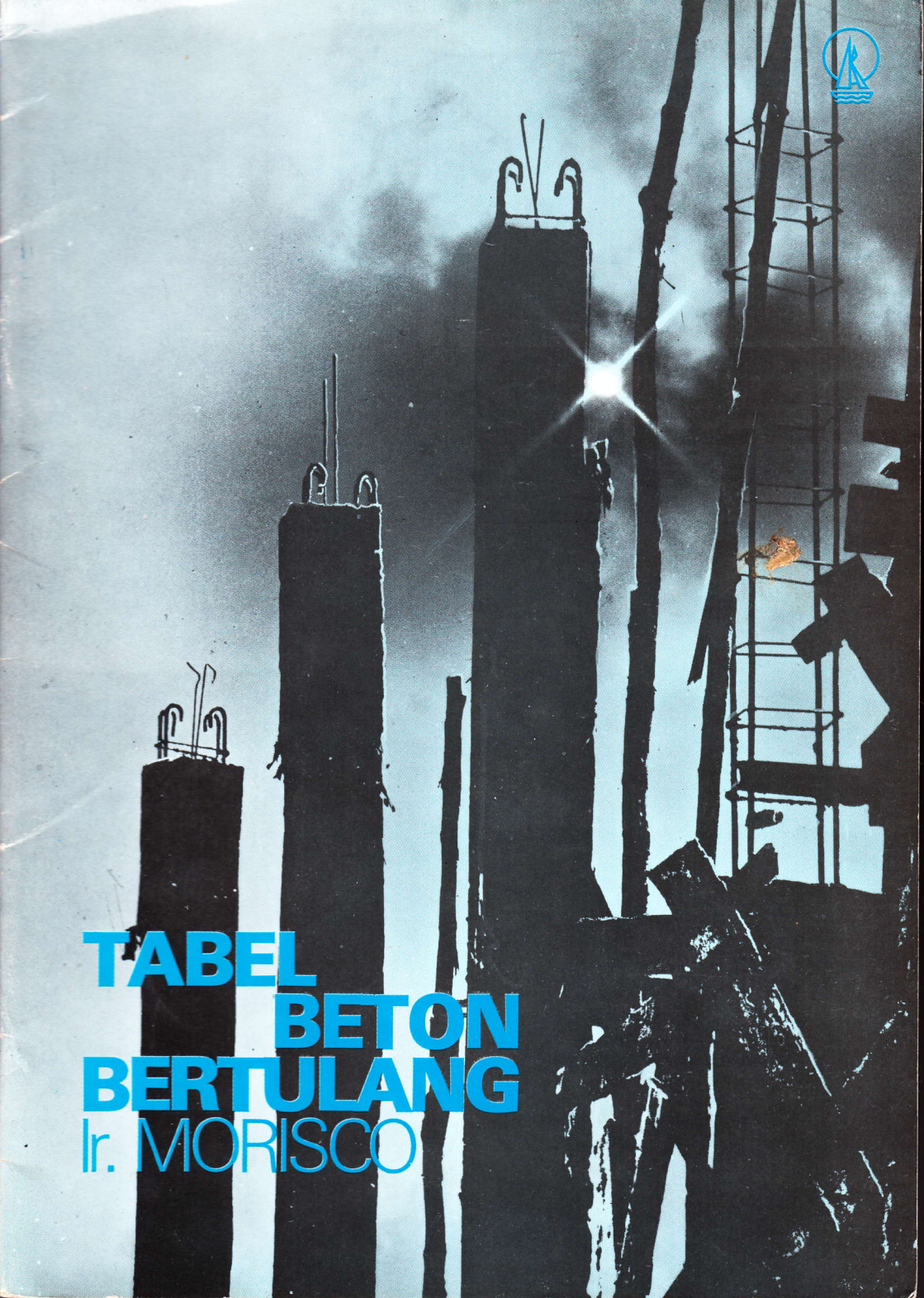

TABEL BETON BERTULANG

Ir. MORISCO

Teguh Sudarso

Ir. MORISCO

TABEL BETON BERTULANG

UNTUK MAHASISWA DAN TEKNISI

PENERBIT KANISIUS

Tabel Beton Bertulang
028021
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Dicetak oleh Percetakan Kanisius Yogyakarta

PRAKATA

Pemakaian tabel pada suatu perencanaan, umumnya akan menyederhanakan serta mempercepat proses hitungan. Menyadari hal tersebut, penulis berusaha menyajikan sebuah kumpulan tabel yang dapat dipakai untuk perencanaan konstruksi beton berdasarkan momen lentur yang terjadi.

Tabel dibuat dengan komputer berdasarkan kekuatan batas. Sedikit teori dan program komputer disertakan, terutama bagi yang berminat pada hal tersebut. Namun demikian, tidaklah berarti bahwa untuk dapat memakai tabel ini saudara harus memahami teori serta program komputer tersebut. Karena tabel ini memang dipersiapkan untuk dapat dipakai oleh mahasiswa, teknisi serta lulusan STM.

Kiranya perlu diingatkan, bahwa untuk pembuatan tabel ini belum diperhitungkan adanya tegangan geser yang timbul pada konstruksi. Sehingga pemakai masih harus memperhitungkan hal tersebut, misalnya dalam menentukan tulangan geser.

Ucapan terima kasih disampaikan kepada Suster Bernardia, serta semua pihak yang telah memungkinkan terbitnya buku ini. Dan kritik serta saran dari para pemakai sangat diharapkan.

Yogyakarta, Agustus 1979.

Penulis.

NOTASI

A = Luas tulangan baja tarik
A' = Luas tulangan baja desak
A_1 = Luas tulangan baja tarik pada momen sebesar M_1
A_2 = Luas tulangan baja desak yang diperlukan pada setiap penambahan besar momen 1 tm.
a = Tinggi blok tegangan desak beton epp. ekivalen
B = Lebar balok beton
$\overline{D}$ = Resultante tegangan desak
H = Tinggi manfaat tampang balok
k_o = Koefisien ordinat blok tegangan desak beton
M = Momen lentur
M_t = Momen lentur pada beban tetap
M_s = Momen lentur pada beban sementara
$\varnothing$ = Koefisien pengaruh pelaksanaan
$\overline{T}$ = Resultante tegangan tarik
z_u = Lengan momen intern pada keadaan ultimit
γ_{ma} = Koefisien bahan untuk baja
γ_{st} = Koefisien beban tetap
γ_{ss} = Koefisien beban sementara
σ'_{bk} = Kuat desak beton karakteristik
σ^*_{au} = Kuat baja rencana
$\omega = \frac{A}{BH}$

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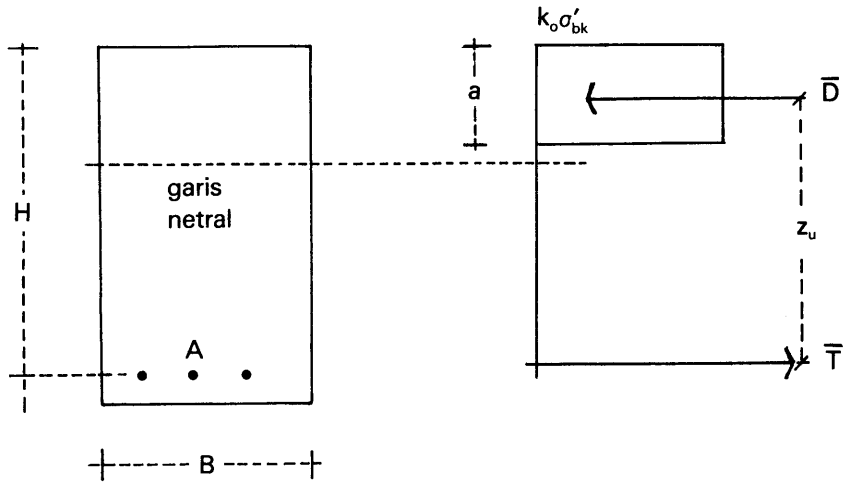
I. PENDAHULUAN

I.1. ANALISA BALOK BETON BERTAMPANG E.P.P

Pada keadaan ultimit, biasa dipakai diagram tegangan beton/tulangan seperti gambar I.1.



Gambar I.1

Menurut ACI, pelenturan tidak menentukan bila:

$$\omega < 0{,}13 \cdot \frac{\sigma'_{bk}}{\sigma^*_{au}}$$

$$\begin{aligned}\overline{T} &= A.\sigma^*_{au} \\ &= \omega \cdot B \cdot H \cdot \sigma^*_{au} \\ &= 0{,}13 \cdot \frac{\sigma'_{bk}}{\sigma^*_{au}} \cdot B.\, H.\, \sigma^*_{au} \\ &= 0{,}13 \cdot \sigma'_{bk} \cdot B \cdot H\end{aligned}$$

$$\overline{D} = k_o \cdot \sigma'_{bk} \cdot B \cdot a$$

Pada keadaan setimbang maka:

$$\bar{D} = \bar{T}$$

$$k_o \cdot \sigma'_{bk} \cdot B.a = 0{,}13 \cdot \sigma'_{bk} \cdot B.H$$

-untuk beban tetap $k_o = 0{,}5\ \varnothing$, diambil $\varnothing = 1$ maka

$$a = 0{,}26\ H$$
$$z_u = H - \tfrac{1}{2}.a = 0{,}87\ H$$

Momen:
$$\bar{M}_t = \bar{T} \cdot z_u$$
$$= 0{,}13 \cdot \sigma'_{bk} \cdot B \cdot H \cdot 0{,}87\ H$$
$$= 0{,}1131 \cdot \sigma'_{bk} \cdot B \cdot H^2$$
$$\bar{M}_t = R_t \cdot B \cdot H^2$$
$$R_t = 0{,}1131 \cdot \sigma'_{bk}$$

-untuk beban sementara $k_o = 0{,}6\ \varnothing$, diambil $\varnothing = 1$ maka

$$a = 0{,}2167\ H$$
$$z_u = H - \tfrac{1}{2}.a = 0{,}89\ H$$

Momen:
$$\bar{M}_s = \bar{T} \cdot z_u$$
$$= 0{,}13 \cdot \sigma'_{bk} \cdot B \cdot H \cdot 0{,}89\ H$$
$$= 0{,}1157 \cdot \sigma'_{bk} \cdot B \cdot H^2$$
$$\bar{M}_s = R_s \cdot B \cdot H^2$$
$$R_s = 0{,}1157 \cdot \sigma'_{bk} \cdot B \cdot H^2$$

Ternyata $R_s \approx R_t$, untuk selanjutnya dipakai $R_s = R_t = 0{,}1131\ \sigma'_{bk}$

I.2. FAKTOR AMAN

Pada perencanaan ultimit dipakai keadaan 'under reinforced'. Sehingga yang menentukan kekuatan adalah tulangannya. Untuk baja tulangan dipakai

$$\gamma_{ma} = 1\ 15$$
$$\gamma_{st} = 1{,}50$$
$$\gamma_{sc} = 1{,}05$$

II. PEMAKAIAN TABEL

II.1. MENENTUKAN UKURAN BALOK

Bila pada suatu balok, telah diketahui besar momen yang bekerja, mutu beton, mutu baja serta jenis pembebanannya (tetap/sementara). Maka langkah untuk menentukan ukurannya adalah sebagai berikut:

(a) Bukalah tabel sesuai dengan mutu beton, mutu baja serta jenis pembebanannya. Beban 1 berarti beban tetap. Beban 2 berarti beban sementara.

(b) Pada tabel tersebut di atas, carilah harga M_1 yang mendekati harga M yang bekerja. Pada umumnya harga M_1 sebesar $\pm$ 0,8 M akan menghasilkan ukuran yang menguntungkan. Bila M_1 terlalu besar berarti pemborosan beton, sedang M_1 yang terlalu kecil berarti pemborosan tulangan serta akan mengakibatkan tegangan geser terlalu besar.

(c) Setelah diketahui letak M_1 tersebut pada b, maka dapat dilihat besar H pada baris yang sama dengan letak M_1 pada kolom paling kiri (H). Besar B juga dapat dilihat pada kolom yang sama dengan letak M_1.

II.2. MENENTUKAN TULANGAN

Pada baris yang sama dengan letak M_1 tersebut pada II.1. dapat dilihat besarnya A_2 serta A_1. Langkah selanjutnya adalah sebagai berikut:

(a) Bila momen yang bekerja (M) lebih kecil dari M_1, maka luas tulangan:

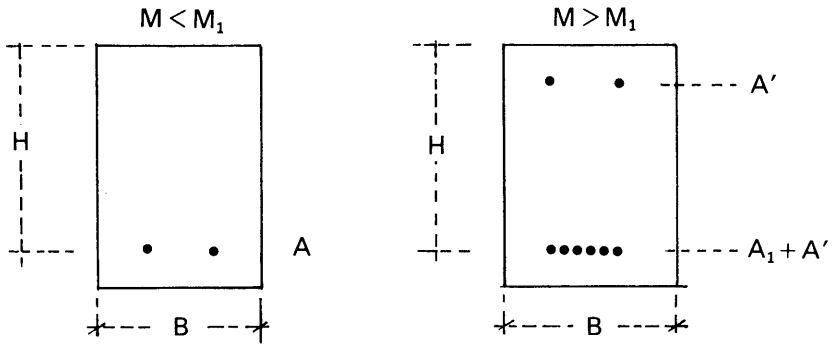
$$A = \frac{M}{M_1} A_1$$

(b) Bila momen yang bekerja (M) lebih besar dari M_1, maka luas tulagan:

Tulangan desak $= A' = (M - M_1) \cdot A_2$

Tulangan tarik $= A_1 + A'$

lihat gambar II.1.b



Gambar II.1.

II.3. CONTOH PEMAKAIAN TABEL

a) Beban sementara, M = 10 tm, Beton K175, Baja U24.
Lihat tabel yang bersangkutan (Tabel IV.11).
Dipilih: B = 30 cm, H = 45 cm.
Dari tabel diperoleh: M_1 = 11,451 tm > M
A_1 = **14,71** cm²

Dari data tersebut dapat dihitung:

$$\text{Tulangan tarik} = A = \frac{M}{M_1} \cdot A_1$$

$$A = \frac{10}{11{,}451} \cdot \mathbf{14{,}71} = \mathbf{12{,}85}\ \text{cm}^2$$

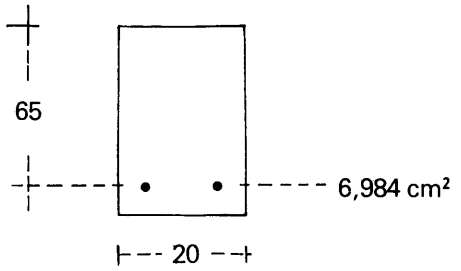
Selain penyelesaian tersebut, masih banyak penyelesaian yang lain, misalnya sebagai berikut:
Lihat tabel IV.11, dipilih B = 25 cm, H = 40 cm.
Dari tabel diperoleh: M_1 = 7,54 tm < M
A_2 = 1,44 cm²
A_1 = 10,90 cm².

Dari data tersebut dapat dihitung:

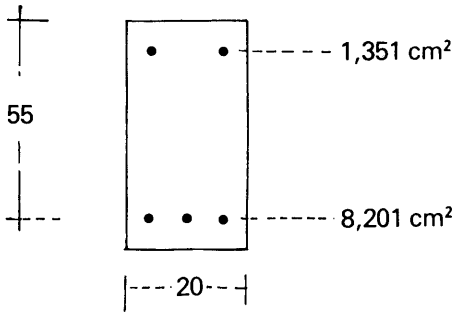
$$\text{Tulangan desak} = A' = (M - M_1) \cdot A_2$$
$$= (10 - 7{,}54) \cdot 1{,}44 = 3{,}54\ \text{cm}^2$$
$$\text{Tulangan tarik} = A_1 + A' = 10{,}90 + 3{,}54 = 14{,}44\ \text{cm}^2$$

(b) Beban tetap, M = 5,500 tm, Beton K100, Baja U24.
Lihat tabel IV.01, dipilih B = 20 cm, H = 65 cm, M_1 > M

$$\text{Tulangan tarik} = \frac{5{,}500}{6{,}371} \cdot 8{,}09 = 6{,}984\ \text{cm}^2.$$

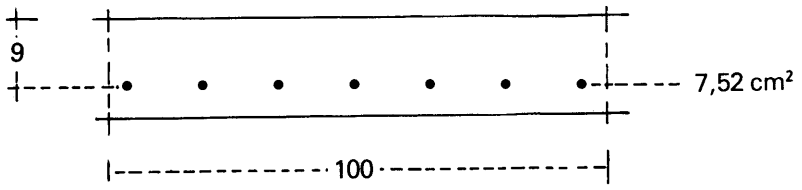


Alternatip lain:
Lihat tabel IV.01, dipilih B = 20 cm, H = 55 cm, M_1 < M
Tulangan desak = (5,500 — 4,562) . 1,44 = 1,351 cm²
Tulangan tarik = 6,85 + 1,351 = 8,201 cm²



(c) Plat beton selebar 100 cm.
Beban tetap, M = 0,82 tm, Beton K175, Baja U24
Lihat tabel IV.17. — Untuk plat pilihlah H sedemikian sehingga $M_1 > M$
Dipilih H = 9 cm.

Tulangan tarik $= \frac{0,82}{1,07} . 9,81 = 7,52 \text{ cm}^2$



Mutu baja (U) = 24/22
Mutu beton (K) = 100/125/175/225
Beban (SF) = 150 (tetap)
105 (sementara)
B = 15 cm.
H = 15 cm.

$M_1 = (0,1131 . K . B . H^2) / (1000 . SF)$
$= (0,1131 . 100 . 15 . 15^2) / (1000 . 150)$
$= 0,254$ tm.

$A_1 = (B . H . K / 4) \times (0,0013 / 0,87)$
$= (15 . 15 . 100 / 24) \times (0,0013 / 0,87)$
$= 1,40 \text{ cm}^2$

$A_2 = 1000 * (SF / (H - 5)) / (0,87 . 100 . 4)$
$= 1000 . (150 / (15 - 5)) / (0,87 . 100 . 24)$
$= 7,18 \text{ cm}^3$

III. PROGRAM KOMPUTER

CATATAN:

Pemrosesan data dikerjakan di PUSKOM UGM.

```
      $JOB MORIS
    1     100 FORMAT(1H1,'HITUNGAN BETON DENGAN KOMPUTER * DIPROGRAM OLEH IR. MO
             1RISCO * BETON K',F4.0,' *BAJA U',F3.0,'BEBAN  ',I2,/)
    2         DIMENSION B(6),TBK(4),U(2),SF(2),XM(6),A(6)
    3         READ(5,60) B(1),B(2),B(3),B(4),B(5),B(6),TBK(1),TBK(2),TBK(3),
             1 TBK(4),U(1),U(2),SF(1),SF(2)
    4         WRITE(6,60)B(1),B(2),B(3),B(4),B(5),B(6),TBK(1),TBK(2),TBK(3),
             1 TBK(4),U(1),U(2),SF(1),SF(2)
    5      60 FORMAT (14F4.0)
    6         X=0.00
    7         DO 70 K=1,2
    8         DO 70 J=1,2
    9         DO 70 I=1,4
   10         WRITE(6,100)TBK(I),U(J),K
   11         WRITE(6,200)
   12         WRITE (6,500)
   13         R   = 0.1131*TBK(I)
   14         H    = 10.
   15     300 H    = H+5.
   16         DO 80 N=1,6
   17         XM(N)=R*B(N)*H**2/(1000.*SF(K))
   18         A(N)= B(N)*H*TBK(I)/U(J)*0.0013 /0.87
   19      80 CONTINUE
   20         A2   = 1000.*SF(K)/(H-5.)/(0.87*100.*U(J))
   21         WRITE (6,400)H,A2,XM(1),A(1),XM(2),A(2),XM(3),A(3),XM(4),A(4),
             1 XM(5),A(5),XM(6),A(6)
   22         IF (H.LT.200.)GO TO 300
   23         X=X+0.01
   24         WRITE (6,600)X
   25      70 CONTINUE
   26     200 FORMAT(6X,'H',6X,'A2',8X,'B = 15 CM',8X,'B = 20 CM',8X,'B = 25 CM'
             1,8X,'B = 30 CM',8X,'B = 40 CM',8X,'B = 50 CM'/)
   27     400 FORMAT (F10.3,F6.2,6(F10.3,F7.2))
   28     500 FORMAT (16X,6(6X,'M1',5X,'A1',2X),/)
   29     600  FORMAT (//,55X,'TABEL IV',F3.2)
   30         STOP
   31         END

       $ENTRY
15. 20. 25. 30. 40. 50.100.125.175.225. 24. 22.150.105.
```

IV. TABEL-TABEL

CATATAN:

Pada tabel hasil hitungan komputer, titik harus dibaca sebagai koma desimal, sehingga 15.000 harus dibaca lima belas.

HITUNGAN BETON DENGAN KOMPUTER * DIPROGRAM OLEH IR. MORISCO * BETON K100. *BAJA U24.BEBAN 1

H	A2	B = 15 CM		B = 20 CM		B = 25 CM		B = 30 CM		B = 40 CM		B = 50 CM	
		M1	A1	M1	A1	M1	A1	M1	A1	M1	A1	M1	A1
15.000	7.18	0.254	1.40	0.339	1.87	0.424	2.33	0.509	2.80	0.679	3.74	0.848	4.67
20.000	4.79	0.452	1.87	0.603	2.49	0.754	3.11	0.905	3.74	1.206	4.98	1.508	6.23
25.000	3.59	0.707	2.33	0.942	3.11	1.178	3.89	1.414	4.67	1.885	6.23	2.356	7.78
30.000	2.87	1.018	2.80	1.357	3.74	1.696	4.67	2.036	5.60	2.714	7.47	3.393	9.34
35.000	2.39	1.385	3.27	1.847	4.36	2.309	5.45	2.771	6.54	3.695	8.72	4.618	10.90
40.000	2.05	1.810	3.74	2.413	4.98	3.016	6.23	3.619	7.47	4.826	9.96	6.032	12.45
45.000	1.80	2.290	4.20	3.054	5.60	3.817	7.00	4.581	8.41	6.107	11.21	7.634	14.01
50.000	1.60	2.827	4.67	3.770	6.23	4.712	7.78	5.655	9.34	7.540	12.45	9.425	15.57
55.000	1.44	3.421	5.14	4.562	6.85	5.702	8.56	6.843	10.27	9.123	13.70	11.404	17.12
60.000	1.31	4.072	5.60	5.429	7.47	6.786	9.34	8.143	11.21	10.858	14.94	13.572	18.68
65.000	1.20	4.778	6.07	6.371	8.09	7.964	10.12	9.557	12.14	12.743	16.19	15.928	20.23
70.000	1.11	5.542	6.54	7.389	8.72	9.236	10.90	11.084	13.07	14.778	17.43	18.473	21.79
75.000	1.03	6.362	7.00	8.482	9.34	10.603	11.67	12.724	14.01	16.965	18.68	21.206	23.35
80.000	0.96	7.238	7.47	9.651	9.96	12.064	12.45	14.477	14.94	19.302	19.92	24.128	24.90
85.000	0.90	8.171	7.94	10.895	10.58	13.619	13.23	16.343	15.88	21.791	21.17	27.238	26.46
90.000	0.85	9.161	8.41	12.215	11.21	15.268	14.01	18.322	16.81	24.430	22.41	30.537	28.02
95.000	0.80	10.207	8.87	13.610	11.83	17.012	14.79	20.415	17.74	27.219	23.66	34.024	29.57
100.000	0.76	11.310	9.34	15.080	12.45	18.850	15.57	22.620	18.68	30.160	24.90	37.700	31.13
105.000	0.72	12.469	9.81	16.626	13.07	20.782	16.34	24.939	19.61	33.251	26.15	41.564	32.69
110.000	0.68	13.685	10.27	18.247	13.70	22.808	17.12	27.370	20.55	36.494	27.39	45.617	34.24
115.000	0.65	14.957	10.74	19.943	14.32	24.929	17.90	29.915	21.48	39.887	28.64	49.858	35.80
120.000	0.62	16.286	11.21	21.715	14.94	27.144	18.68	32.573	22.41	43.430	29.89	54.288	37.36
125.000	0.60	17.672	11.67	23.562	15.57	29.453	19.46	35.344	23.35	47.125	31.13	58.906	38.91
130.000	0.57	19.114	12.14	25.485	16.19	31.856	20.23	38.228	24.28	50.970	32.38	63.713	40.47
135.000	0.55	20.612	12.61	27.483	16.81	34.354	21.01	41.225	25.22	54.967	33.62	68.708	42.03
140.000	0.53	22.168	13.07	29.557	17.43	36.946	21.79	44.335	26.15	59.114	34.87	73.892	43.58
145.000	0.51	23.779	13.54	31.706	18.06	39.632	22.57	47.559	27.08	63.411	36.11	79.264	45.14
150.000	0.50	25.447	14.01	33.930	18.68	42.412	23.35	50.895	28.02	67.860	37.36	84.825	46.70
155.000	0.48	27.172	14.48	36.230	19.30	45.287	24.13	54.345	28.95	72.459	38.60	90.574	48.25
160.000	0.46	28.954	14.94	38.605	19.92	48.256	24.90	57.907	29.89	77.210	39.85	96.512	49.81
165.000	0.45	30.791	15.41	41.055	20.55	51.319	25.68	61.583	30.82	82.111	41.09	102.638	51.36
170.000	0.44	32.686	15.88	43.581	21.17	54.476	26.46	65.372	31.75	87.162	42.34	108.953	52.92
175.000	0.42	34.637	16.34	46.182	21.79	57.728	27.24	69.274	32.69	92.365	43.58	115.456	54.48
180.000	0.41	36.644	16.81	48.859	22.41	61.074	28.02	73.289	33.62	97.718	44.83	122.148	56.03
185.000	0.40	38.708	17.28	51.611	23.04	64.514	28.80	77.417	34.55	103.223	46.07	129.028	57.59
190.000	0.39	40.829	17.74	54.439	23.66	68.048	29.57	81.658	35.49	108.878	47.32	136.097	59.15
195.000	0.38	43.006	18.21	57.342	24.28	71.677	30.35	86.012	36.42	114.683	48.56	143.354	60.70
200.000	0.37	45.240	18.68	60.320	24.90	75.400	31.13	90.480	37.36	120.640	49.81	150.800	62.26

TABEL 1

HITUNGAN BETON DENGAN KOMPUTER * DIPROGRAM OLEH IR. MORISCO * BETON K125. *BAJA U24.BEBAN 1

H	A2	B = 15 CM		B = 20 CM		B = 25 CM		B = 30 CM		B = 40 CM		B = 50 CM	
		M1	A1	M1	A1	M1	A1	M1	A1	M1	A1	M1	A1
15.000	7.18	0.318	1.75	0.424	2.33	0.530	2.92	0.636	3.50	0.848	4.67	1.060	5.84
20.000	4.79	0.565	2.33	0.754	3.11	0.942	3.89	1.131	4.67	1.508	6.23	1.885	7.78
25.000	3.59	0.884	2.92	1.178	3.89	1.473	4.86	1.767	5.84	2.356	7.78	2.945	9.73
30.000	2.87	1.272	3.50	1.696	4.67	2.121	5.84	2.545	7.00	3.393	9.34	4.241	11.67
35.000	2.39	1.732	4.09	2.309	5.45	2.886	6.81	3.464	8.17	4.618	10.90	5.773	13.62
40.000	2.05	2.262	4.67	3.016	6.23	3.770	7.78	4.524	9.34	6.032	12.45	7.540	15.57
45.000	1.80	2.863	5.25	3.817	7.00	4.771	8.76	5.726	10.51	7.634	14.01	9.543	17.51
50.000	1.60	3.534	5.84	4.712	7.78	5.891	9.73	7.069	11.67	9.425	15.57	11.781	19.46
55.000	1.44	4.277	6.42	5.702	8.56	7.128	10.70	8.553	12.84	11.404	17.12	14.255	21.40
60.000	1.31	5.089	7.00	6.786	9.34	8.482	11.67	10.179	14.01	13.572	18.68	16.965	23.35
65.000	1.20	5.973	7.59	7.964	10.12	9.955	12.65	11.946	15.18	15.928	20.23	19.910	25.29
70.000	1.11	6.927	8.17	9.236	10.90	11.546	13.62	13.855	16.34	18.473	21.79	23.091	27.24
75.000	1.03	7.952	8.76	10.603	11.67	13.254	14.59	15.905	17.51	21.206	23.35	26.508	29.18
80.000	0.96	9.048	9.34	12.064	12.45	15.080	15.57	18.096	18.68	24.128	24.90	30.160	31.13
85.000	0.90	10.214	9.92	13.619	13.23	17.024	16.54	20.429	19.85	27.238	26.46	34.048	33.08
90.000	0.85	11.451	10.51	15.268	14.01	19.086	17.51	22.903	21.01	30.537	28.02	38.171	35.02
95.000	0.80	12.759	11.09	17.012	14.79	21.265	18.48	25.518	22.18	34.024	29.57	42.530	36.97
100.000	0.76	14.137	11.67	18.850	15.57	23.562	19.46	28.275	23.35	37.700	31.13	47.125	38.91
105.000	0.72	15.587	12.26	20.782	16.34	25.978	20.43	31.173	24.52	41.564	32.69	51.955	40.86
110.000	0.68	17.106	12.84	22.808	17.12	28.511	21.40	34.213	25.68	45.617	34.24	57.021	42.80
115.000	0.65	18.697	13.42	24.929	17.90	31.161	22.37	37.394	26.85	49.858	35.80	62.323	44.75
120.000	0.62	20.358	14.01	27.144	18.68	33.930	23.35	40.716	28.02	54.288	37.36	67.860	46.70
125.000	0.60	22.090	14.59	29.453	19.46	36.816	24.32	44.180	29.18	58.906	38.91	73.633	48.64
130.000	0.57	23.892	15.18	31.856	20.23	39.821	25.29	47.785	30.35	63.713	40.47	79.641	50.59
135.000	0.55	25.766	15.76	34.354	21.01	42.943	26.27	51.531	31.52	68.708	42.03	85.885	52.53
140.000	0.53	27.709	16.34	36.946	21.79	46.182	27.24	55.419	32.69	73.892	43.58	92.365	54.48
145.000	0.51	29.724	16.93	39.632	22.57	49.540	28.21	59.448	33.85	79.264	45.14	99.080	56.42
150.000	0.50	31.809	17.51	42.412	23.35	53.016	29.18	63.619	35.02	84.825	46.70	106.031	58.37
155.000	0.48	33.965	18.09	45.287	24.13	56.609	30.16	67.931	36.19	90.574	48.25	113.218	60.31
160.000	0.46	36.192	18.68	48.256	24.90	60.320	31.13	72.384	37.36	96.512	49.81	120.640	62.26
165.000	0.45	38.489	19.26	51.319	25.68	64.149	32.10	76.979	38.52	102.638	51.36	128.298	64.21
170.000	0.44	40.857	19.85	54.476	26.46	68.096	33.08	81.715	39.69	108.953	52.92	136.191	66.15
175.000	0.42	43.296	20.43	57.728	27.24	72.160	34.05	86.592	40.86	115.456	54.48	144.320	68.10
180.000	0.41	45.805	21.01	61.074	28.02	76.342	35.02	91.611	42.03	122.148	56.03	152.685	70.04
185.000	0.40	48.386	21.60	64.514	28.80	80.643	35.99	96.771	43.19	129.028	57.59	161.285	71.99
190.000	0.39	51.036	22.18	68.048	29.57	85.061	36.97	102.073	44.36	136.097	59.15	170.121	73.93
195.000	0.38	53.758	22.76	71.677	30.35	89.596	37.94	107.516	45.53	143.354	60.70	179.193	75.88
200.000	0.37	56.550	23.35	75.400	31.13	94.250	38.91	113.100	46.70	150.800	62.26	188.500	77.83

TABEL 2

HITUNGAN BETON DENGAN KOMPUTER * DIPROGRAM OLEH IR. MORISCO * BETON K175. *BAJA U24.BEBAN 1

H	A2	B = 15 CM		B = 20 CM		B = 25 CM		B = 30 CM		B = 40 CM		B = 50 CM	
		M1	A1	M1	A1	M1	A1	M1	A1	M1	A1	M1	A1
15.000	7.18	0.445	2.45	0.594	3.27	0.742	4.09	0.891	4.90	1.188	6.54	1.484	8.17
20.000	4.79	0.792	3.27	1.056	4.36	1.319	5.45	1.583	6.54	2.111	8.72	2.639	10.90
25.000	3.59	1.237	4.09	1.649	5.45	2.062	6.81	2.474	8.17	3.299	10.90	4.123	13.62
30.000	2.87	1.781	4.90	2.375	6.54	2.969	8.17	3.563	9.81	4.750	13.07	5.938	16.34
35.000	2.39	2.425	5.72	3.233	7.63	4.041	9.53	4.849	11.44	6.466	15.25	8.082	19.07
40.000	2.05	3.167	6.54	4.222	8.72	5.278	10.90	6.334	13.07	8.445	17.43	10.556	21.79
45.000	1.80	4.008	7.35	5.344	9.81	6.680	12.26	8.016	14.71	10.688	19.61	13.360	24.52
50.000	1.60	4.948	8.17	6.597	10.90	8.247	13.62	9.896	16.34	13.195	21.79	16.494	27.24
55.000	1.44	5.987	8.99	7.983	11.99	9.979	14.98	11.974	17.98	15.966	23.97	19.957	29.96
60.000	1.31	7.125	9.81	9.500	13.07	11.875	16.34	14.251	19.61	19.001	26.15	23.751	32.69
65.000	1.20	8.362	10.62	11.150	14.16	13.937	17.71	16.725	21.25	22.300	28.33	27.874	35.41
70.000	1.11	9.698	11.44	12.931	15.25	16.164	19.07	19.397	22.88	25.862	30.51	32.328	38.13
75.000	1.03	11.133	12.26	14.844	16.34	18.555	20.43	22.267	24.52	29.689	32.69	37.111	40.86
80.000	0.96	12.667	13.07	16.890	17.43	21.112	21.79	25.334	26.15	33.779	34.87	42.224	43.58
85.000	0.90	14.300	13.89	19.067	18.52	23.833	23.15	28.600	27.78	38.134	37.04	47.667	46.31
90.000	0.85	16.032	14.71	21.376	19.61	26.720	24.52	32.064	29.42	42.752	39.22	53.440	49.03
95.000	0.80	17.863	15.53	23.817	20.70	29.771	25.88	35.725	31.05	47.634	41.40	59.542	51.75
100.000	0.76	19.792	16.34	26.390	21.79	32.987	27.24	39.585	32.69	52.780	43.58	65.975	54.48
105.000	0.72	21.821	17.16	29.095	22.88	36.369	28.60	43.642	34.32	58.190	45.76	72.737	57.20
110.000	0.68	23.949	17.98	31.932	23.97	39.915	29.96	47.898	35.96	63.864	47.94	79.830	59.93
115.000	0.65	26.176	18.79	34.901	25.06	43.626	31.32	52.351	37.59	69.802	50.12	87.252	62.65
120.000	0.62	28.501	19.61	38.002	26.15	47.502	32.69	57.002	39.22	76.003	52.30	95.004	65.37
125.000	0.60	30.926	20.43	41.234	27.24	51.543	34.05	61.852	40.86	82.469	54.48	103.086	68.10
130.000	0.57	33.449	21.25	44.599	28.33	55.749	35.41	66.899	42.49	89.198	56.66	111.498	70.82
135.000	0.55	36.072	22.06	48.096	29.42	60.120	36.77	72.144	44.13	96.192	58.84	120.239	73.55
140.000	0.53	38.793	22.88	51.724	30.51	64.655	38.13	77.587	45.76	103.449	61.02	129.311	76.27
145.000	0.51	41.614	23.70	55.485	31.60	69.356	39.50	83.227	47.40	110.970	63.19	138.712	78.99
150.000	0.50	44.533	24.52	59.377	32.69	74.222	40.86	89.066	49.03	118.755	65.37	148.444	81.72
155.000	0.48	47.551	25.33	63.402	33.78	79.252	42.22	95.103	50.66	126.804	67.55	158.505	84.44
160.000	0.46	50.669	26.15	67.558	34.87	84.448	43.58	101.338	52.30	135.117	69.73	168.896	87.16
165.000	0.45	53.885	26.97	71.847	35.96	89.808	44.94	107.770	53.93	143.693	71.91	179.617	89.89
170.000	0.44	57.200	27.78	76.267	37.04	95.334	46.31	114.401	55.57	152.534	74.09	190.668	92.61
175.000	0.42	60.614	28.60	80.819	38.13	101.024	47.67	121.229	57.20	161.639	76.27	202.048	95.34
180.000	0.41	64.128	29.42	85.504	39.22	106.879	49.03	128.255	58.84	171.007	78.45	213.759	98.06
185.000	0.40	67.740	30.24	90.320	40.31	112.900	50.39	135.480	60.47	180.639	80.63	225.799	100.78
190.000	0.39	71.451	31.05	95.268	41.40	119.085	51.75	142.902	62.10	190.536	82.81	238.170	103.51
195.000	0.38	75.261	31.87	100.348	42.49	125.435	53.12	150.522	63.74	200.696	84.99	250.870	106.23
200.000	0.37	79.170	32.69	105.560	43.58	131.950	54.48	158.340	65.37	211.120	87.16	263.900	108.96

TABEL 3

HITUNGAN BETON DENGAN KOMPUTER * DIPROGRAM OLEH IR. MORISCO * BETON K225. *BAJA U24.BEBAN 1

H	A2	B = 15 CM		B = 20 CM		B = 25 CM		B = 30 CM		B = 40 CM		B = 50 CM	
		M1	A1	M1	A1	M1	A1	M1	A1	M1	A1	M1	A1
15.000	7.18	0.573	3.15	0.763	4.20	0.954	5.25	1.145	6.30	1.527	8.41	1.909	10.51
20.000	4.79	1.018	4.20	1.357	5.60	1.696	7.00	2.036	8.41	2.714	11.21	3.393	14.01
25.000	3.59	1.590	5.25	2.121	7.00	2.651	8.76	3.181	10.51	4.241	14.01	5.302	17.51
30.000	2.87	2.290	6.30	3.054	8.41	3.817	10.51	4.581	12.61	6.107	16.81	7.634	21.01
35.000	2.39	3.117	7.35	4.156	9.81	5.196	12.26	6.235	14.71	8.313	19.61	10.391	24.52
40.000	2.05	4.072	8.41	5.429	11.21	6.786	14.01	8.143	16.81	10.858	22.41	13.572	28.02
45.000	1.80	5.153	9.46	6.871	12.61	8.589	15.76	10.306	18.91	13.742	25.22	17.177	31.52
50.000	1.60	6.362	10.51	8.482	14.01	10.603	17.51	12.724	21.01	16.965	28.02	21.206	35.02
55.000	1.44	7.698	11.56	10.264	15.41	12.830	19.26	15.396	23.11	20.528	30.82	25.660	38.52
60.000	1.31	9.161	12.61	12.215	16.81	15.268	21.01	18.322	25.22	24.430	33.62	30.537	42.03
65.000	1.20	10.752	13.66	14.335	18.21	17.919	22.76	21.503	27.32	28.671	36.42	35.839	45.53
70.000	1.11	12.469	14.71	16.626	19.61	20.782	24.52	24.939	29.42	33.251	39.22	41.564	49.03
75.000	1.03	14.314	15.76	19.086	21.01	23.857	26.27	28.628	31.52	38.171	42.03	47.714	52.53
80.000	0.96	16.286	16.81	21.715	22.41	27.144	28.02	32.573	33.62	43.430	44.83	54.288	56.03
85.000	0.90	18.386	17.86	24.514	23.81	30.643	29.77	36.772	35.72	49.029	47.63	61.286	59.54
90.000	0.85	20.612	18.91	27.483	25.22	34.354	31.52	41.225	37.82	54.967	50.43	68.708	63.04
95.000	0.80	22.966	19.96	30.622	26.62	38.277	33.27	45.933	39.92	61.244	53.23	76.555	66.54
100.000	0.76	25.447	21.01	33.930	28.02	42.412	35.02	50.895	42.03	67.860	56.03	84.825	70.04
105.000	0.72	28.056	22.06	37.408	29.42	46.760	36.77	56.112	44.13	74.816	58.84	93.520	73.55
110.000	0.68	30.791	23.11	41.055	30.82	51.319	38.52	61.583	46.23	82.111	61.64	102.638	77.05
115.000	0.65	33.654	24.16	44.872	32.22	56.090	40.27	67.309	48.33	89.745	64.44	112.181	80.55
120.000	0.62	36.644	25.22	48.859	33.62	61.074	42.03	73.289	50.43	97.718	67.24	122.148	84.05
125.000	0.60	39.762	26.27	53.016	35.02	66.269	43.78	79.523	52.53	106.031	70.04	132.539	87.55
130.000	0.57	43.006	27.32	57.342	36.42	71.677	45.53	86.013	54.63	114.683	72.84	143.354	91.06
135.000	0.55	46.378	28.37	61.837	37.82	77.297	47.28	92.756	56.73	123.675	75.65	154.593	94.56
140.000	0.53	49.877	29.42	66.503	39.22	83.128	49.03	99.754	58.84	133.006	78.45	166.257	98.06
145.000	0.51	53.503	30.47	71.338	40.62	89.172	50.78	107.007	60.94	142.676	81.25	178.344	101.56
150.000	0.50	57.257	31.52	76.342	42.03	95.428	52.53	114.514	63.04	152.685	84.05	190.856	105.06
155.000	0.48	61.138	32.57	81.517	43.43	101.896	54.28	122.275	65.14	163.033	86.85	203.792	108.57
160.000	0.46	65.146	33.62	86.861	44.83	108.576	56.03	130.291	67.24	173.721	89.66	217.152	112.07
165.000	0.45	69.281	34.67	92.374	46.23	115.468	57.79	138.562	69.34	184.749	92.46	230.936	115.57
170.000	0.44	73.543	35.72	98.058	47.63	122.572	59.54	147.087	71.44	196.115	95.26	245.144	119.07
175.000	0.42	77.933	36.77	103.911	49.03	129.888	61.29	155.866	73.55	207.821	98.06	259.776	122.58
180.000	0.41	82.450	37.82	109.933	50.43	137.416	63.04	164.900	75.65	219.866	100.86	274.833	126.08
185.000	0.40	87.094	38.87	116.125	51.83	145.157	64.79	174.188	77.75	232.251	103.66	290.313	129.58
190.000	0.39	91.865	39.92	122.487	53.23	153.109	66.54	183.731	79.85	244.975	106.47	306.218	133.08
195.000	0.38	96.764	40.98	129.019	54.63	161.273	68.29	193.528	81.95	258.037	109.27	322.547	136.58
200.000	0.37	101.790	42.03	135.720	56.03	169.650	70.04	203.580	84.05	271.440	112.07	339.300	140.09

TABEL 4

HITUNGAN BETON DENGAN KOMPUTER * DIPROGRAM OLEH IR. MORISCO * BETON K100. *BAJA U22.BEBAN 1

H	A2	B = 15 CM		B = 20 CM		B = 25 CM		B = 30 CM		B = 40 CM		B = 50 CM	
		M1	A1	M1	A1	M1	A1	M1	A1	M1	A1	M1	A1
15.000	7.84	0.254	1.53	0.339	2.04	0.424	2.55	0.509	3.06	0.679	4.08	0.848	5.09
20.000	5.22	0.452	2.04	0.603	2.72	0.754	3.40	0.905	4.08	1.206	5.43	1.508	6.79
25.000	3.92	0.707	2.55	0.942	3.40	1.178	4.25	1.414	5.09	1.885	6.79	2.356	8.49
30.000	3.13	1.018	3.06	1.357	4.08	1.696	5.09	2.036	6.11	2.714	8.15	3.393	10.19
35.000	2.61	1.385	3.57	1.847	4.75	2.309	5.94	2.771	7.13	3.695	9.51	4.618	11.89
40.000	2.24	1.810	4.08	2.413	5.43	3.016	6.79	3.619	8.15	4.826	10.87	6.032	13.58
45.000	1.96	2.290	4.58	3.054	6.11	3.817	7.64	4.581	9.17	6.107	12.23	7.634	15.28
50.000	1.74	2.827	5.09	3.770	6.79	4.712	8.49	5.655	10.19	7.540	13.58	9.425	16.98
55.000	1.57	3.421	5.60	4.562	7.47	5.702	9.34	6.843	11.21	9.123	14.94	11.404	18.68
60.000	1.42	4.072	6.11	5.429	8.15	6.786	10.19	8.143	12.23	10.858	16.30	13.572	20.38
65.000	1.31	4.778	6.62	6.371	8.83	7.964	11.04	9.557	13.24	12.743	17.66	15.928	22.07
70.000	1.21	5.542	7.13	7.389	9.51	9.236	11.89	11.084	14.26	14.778	19.02	18.473	23.77
75.000	1.12	6.362	7.64	8.482	10.19	10.603	12.74	12.724	15.28	16.965	20.38	21.206	25.47
80.000	1.04	7.238	8.15	9.651	10.87	12.064	13.58	14.477	16.30	19.302	21.73	24.128	27.17
85.000	0.98	8.171	8.66	10.895	11.55	13.619	14.43	16.343	17.32	21.791	23.09	27.238	28.87
90.000	0.92	9.161	9.17	12.215	12.23	15.268	15.28	18.322	18.34	24.430	24.45	30.537	30.56
95.000	0.87	10.207	9.68	13.610	12.90	17.012	16.13	20.415	19.36	27.219	25.81	34.024	32.26
100.000	0.82	11.310	10.19	15.080	13.58	18.850	16.98	22.620	20.38	30.160	27.17	37.700	33.96
105.000	0.78	12.469	10.70	16.626	14.26	20.782	17.83	24.939	21.39	33.251	28.53	41.564	35.66
110.000	0.75	13.685	11.21	18.247	14.94	22.808	18.68	27.370	22.41	36.494	29.89	45.617	37.36
115.000	0.71	14.957	11.72	19.943	15.62	24.929	19.53	29.915	23.43	39.887	31.24	49.858	39.05
120.000	0.68	16.286	12.23	21.715	16.30	27.144	20.38	32.573	24.45	43.430	32.60	54.288	40.75
125.000	0.65	17.672	12.74	23.562	16.98	29.453	21.23	35.344	25.47	47.125	33.96	58.906	42.45
130.000	0.63	19.114	13.24	25.485	17.66	31.856	22.07	38.228	26.49	50.970	35.32	63.713	44.15
135.000	0.60	20.612	13.75	27.483	18.34	34.354	22.92	41.225	27.51	54.967	36.68	68.708	45.85
140.000	0.58	22.168	14.26	29.557	19.02	36.946	23.77	44.335	28.53	59.114	38.04	73.892	47.54
145.000	0.56	23.779	14.77	31.706	19.70	39.632	24.62	47.559	29.55	63.411	39.39	79.264	49.24
150.000	0.54	25.447	15.28	33.930	20.38	42.412	25.47	50.895	30.56	67.860	40.75	84.825	50.94
155.000	0.52	27.172	15.79	36.230	21.06	45.287	26.32	54.345	31.58	72.459	42.11	90.574	52.64
160.000	0.51	28.954	16.30	38.605	21.73	48.256	27.17	57.907	32.60	77.210	43.47	96.512	54.34
165.000	0.49	30.791	16.81	41.055	22.41	51.319	28.02	61.583	33.62	82.111	44.83	102.638	56.03
170.000	0.47	32.686	17.32	43.581	23.09	54.476	28.87	65.372	34.64	87.162	46.19	108.953	57.73
175.000	0.46	34.637	17.83	46.182	23.77	57.728	29.72	69.274	35.66	92.365	47.54	115.456	59.43
180.000	0.45	36.644	18.34	48.859	24.45	61.074	30.56	73.289	36.68	97.718	48.90	122.148	61.13
185.000	0.44	38.708	18.85	51.611	25.13	64.514	31.41	77.417	37.70	103.223	50.26	129.028	62.83
190.000	0.42	40.829	19.36	54.439	25.81	68.048	32.26	81.658	38.71	108.878	51.62	136.097	64.52
195.000	0.41	43.006	19.87	57.342	26.49	71.677	33.11	86.012	39.73	114.683	52.98	143.354	66.22
200.000	0.40	45.240	20.38	60.320	27.17	75.400	33.96	90.480	40.75	120.640	54.34	150.800	67.92

TABEL 5

HITUNGAN BETON DENGAN KOMPUTER * DIPROGRAM OLEH IR. MORISCO * BETON K125. *BAJA U22.BEBAN 1

H	A2	B = 15 CM		B = 20 CM		B = 25 CM		B = 30 CM		B = 40 CM		B = 50 CM	
		M1	A1	M1	A1	M1	A1	M1	A1	M1	A1	M1	A1
15.000	7.84	0.318	1.91	0.424	2.55	0.530	3.18	0.636	3.82	0.848	5.09	1.060	6.37
20.000	5.22	0.565	2.55	0.754	3.40	0.942	4.25	1.131	5.09	1.508	6.79	1.885	8.49
25.000	3.92	0.884	3.18	1.178	4.25	1.473	5.31	1.767	6.37	2.356	8.49	2.945	10.61
30.000	3.13	1.272	3.82	1.696	5.09	2.121	6.37	2.545	7.64	3.393	10.19	4.241	12.74
35.000	2.61	1.732	4.46	2.309	5.94	2.886	7.43	3.464	8.91	4.618	11.89	5.773	14.86
40.000	2.24	2.262	5.09	3.016	6.79	3.770	8.49	4.524	10.19	6.032	13.58	7.540	16.98
45.000	1.96	2.863	5.73	3.817	7.64	4.771	9.55	5.726	11.46	7.634	15.28	9.543	19.10
50.000	1.74	3.534	6.37	4.712	8.49	5.891	10.61	7.069	12.74	9.425	16.98	11.781	21.23
55.000	1.57	4.277	7.00	5.702	9.34	7.128	11.67	8.553	14.01	11.404	18.68	14.255	23.35
60.000	1.42	5.089	7.64	6.786	10.19	8.482	12.74	10.179	15.28	13.572	20.38	16.965	25.47
65.000	1.31	5.973	8.28	7.964	11.04	9.955	13.80	11.946	16.56	15.928	22.07	19.910	27.59
70.000	1.21	6.927	8.91	9.236	11.89	11.546	14.86	13.855	17.83	18.473	23.77	23.091	29.72
75.000	1.12	7.952	9.55	10.603	12.74	13.254	15.92	15.905	19.10	21.206	25.47	26.508	31.84
80.000	1.04	9.048	10.19	12.064	13.58	15.080	16.98	18.096	20.38	24.128	27.17	30.160	33.96
85.000	0.98	10.214	10.82	13.619	14.43	17.024	18.04	20.429	21.65	27.238	28.87	34.048	36.08
90.000	0.92	11.451	11.46	15.268	15.28	19.086	19.10	22.903	22.92	30.537	30.56	38.171	38.21
95.000	0.87	12.759	12.10	17.012	16.13	21.265	20.16	25.518	24.20	34.024	32.26	42.530	40.33
100.000	0.82	14.137	12.74	18.850	16.98	23.562	21.23	28.275	25.47	37.700	33.96	47.125	42.45
105.000	0.78	15.587	13.37	20.782	17.83	25.978	22.29	31.173	26.74	41.564	35.66	51.955	44.57
110.000	0.75	17.106	14.01	22.808	18.68	28.511	23.35	34.213	28.02	45.617	37.36	57.021	46.70
115.000	0.71	18.697	14.65	24.929	19.53	31.161	24.41	37.394	29.29	49.858	39.05	62.323	48.82
120.000	0.68	20.358	15.28	27.144	20.38	33.930	25.47	40.716	30.56	54.288	40.75	67.860	50.94
125.000	0.65	22.090	15.92	29.453	21.23	36.816	26.53	44.180	31.84	58.906	42.45	73.633	53.06
130.000	0.63	23.892	16.56	31.856	22.07	39.821	27.59	47.785	33.11	63.713	44.15	79.641	55.19
135.000	0.60	25.766	17.19	34.354	22.92	42.943	28.65	51.531	34.38	68.708	45.85	85.885	57.31
140.000	0.58	27.709	17.83	36.946	23.77	46.182	29.72	55.419	35.66	73.892	47.54	92.365	59.43
145.000	0.56	29.724	18.47	39.632	24.62	49.540	30.78	59.448	36.93	79.264	49.24	99.080	61.55
150.000	0.54	31.809	19.10	42.412	25.47	53.016	31.84	63.619	38.21	84.825	50.94	106.031	63.68
155.000	0.52	33.965	19.74	45.287	26.32	56.609	32.90	67.931	39.48	90.574	52.64	113.218	65.80
160.000	0.51	36.192	20.38	48.256	27.17	60.320	33.96	72.384	40.75	96.512	54.34	120.640	67.92
165.000	0.49	38.489	21.01	51.319	28.02	64.149	35.02	76.979	42.03	102.638	56.03	128.298	70.04
170.000	0.47	40.857	21.65	54.476	28.87	68.096	36.08	81.715	43.30	108.953	57.73	136.191	72.17
175.000	0.46	43.296	22.29	57.728	29.72	72.160	37.14	86.592	44.57	115.456	59.43	144.320	74.29
180.000	0.45	45.805	22.92	61.074	30.56	76.342	38.21	91.611	45.85	122.148	61.13	152.685	76.41
185.000	0.44	48.386	23.56	64.514	31.41	80.643	39.27	96.771	47.12	129.028	62.83	161.285	78.53
190.000	0.42	51.036	24.20	68.048	32.26	85.061	40.33	102.073	48.39	136.097	64.52	170.121	80.66
195.000	0.41	53.758	24.83	71.677	33.11	89.596	41.39	107.516	49.67	143.354	66.22	179.193	82.78
200.000	0.40	56.550	25.47	75.400	33.96	94.250	42.45	113.100	50.94	150.800	67.92	188.500	84.90

TABEL 6

HITUNGAN BETON DENGAN KOMPUTER * DIPROGRAM OLEH IR. MORISCO * BETON K175. *BAJA U22.BEBAN 1

H	A2	B = 15 CM		B = 20 CM		B = 25 CM		B = 30 CM		B = 40 CM		B = 50 CM	
		M1	A1	M1	A1	M1	A1	M1	A1	M1	A1	M1	A1
15.000	7.84	0.445	2.67	0.594	3.57	0.742	4.46	0.891	5.35	1.188	7.13	1.484	8.91
20.000	5.22	0.792	3.57	1.056	4.75	1.319	5.94	1.583	7.13	2.111	9.51	2.639	11.89
25.000	3.92	1.237	4.46	1.649	5.94	2.062	7.43	2.474	8.91	3.299	11.89	4.123	14.86
30.000	3.13	1.781	5.35	2.375	7.13	2.969	8.91	3.563	10.70	4.750	14.26	5.938	17.83
35.000	2.61	2.425	6.24	3.233	8.32	4.041	10.40	4.849	12.48	6.466	16.64	8.082	20.80
40.000	2.24	3.167	7.13	4.222	9.51	5.278	11.89	6.334	14.26	8.445	19.02	10.556	23.77
45.000	1.96	4.008	8.02	5.344	10.70	6.680	13.37	8.016	16.05	10.688	21.39	13.360	26.74
50.000	1.74	4.948	8.91	6.597	11.89	8.247	14.86	9.896	17.83	13.195	23.77	16.494	29.72
55.000	1.57	5.987	9.81	7.983	13.07	9.979	16.34	11.974	19.61	15.966	26.15	19.957	32.69
60.000	1.42	7.125	10.70	9.500	14.26	11.875	17.83	14.251	21.39	19.001	28.53	23.751	35.66
65.000	1.31	8.362	11.59	11.150	15.45	13.937	19.31	16.725	23.18	22.300	30.90	27.874	38.63
70.000	1.21	9.698	12.48	12.931	16.64	16.164	20.80	19.397	24.96	25.862	33.28	32.328	41.60
75.000	1.12	11.133	13.37	14.844	17.83	18.555	22.29	22.267	26.74	29.689	35.66	37.111	44.57
80.000	1.04	12.667	14.26	16.890	19.02	21.112	23.77	25.334	28.53	33.779	38.04	42.224	47.54
85.000	0.98	14.300	15.15	19.067	20.21	23.833	25.26	28.600	30.31	38.134	40.41	47.667	50.52
90.000	0.92	16.032	16.05	21.376	21.39	26.720	26.74	32.064	32.09	42.752	42.79	53.440	53.49
95.000	0.87	17.863	16.94	23.817	22.58	29.771	28.23	35.725	33.88	47.634	45.17	59.542	56.46
100.000	0.82	19.792	17.83	26.390	23.77	32.987	29.72	39.585	35.66	52.780	47.54	65.975	59.43
105.000	0.78	21.821	18.72	29.095	24.96	36.369	31.20	43.642	37.44	58.190	49.92	72.737	62.40
110.000	0.75	23.949	19.61	31.932	26.15	39.915	32.69	47.898	39.22	63.864	52.30	79.830	65.37
115.000	0.71	26.176	20.50	34.901	27.34	43.626	34.17	52.351	41.01	69.802	54.68	87.252	68.35
120.000	0.68	28.501	21.39	38.002	28.53	47.502	35.66	57.002	42.79	76.003	57.05	95.004	71.32
125.000	0.65	30.926	22.29	41.234	29.72	51.543	37.14	61.852	44.57	82.469	59.43	103.086	74.29
130.000	0.63	33.449	23.18	44.599	30.90	55.749	38.63	66.899	46.36	89.198	61.81	111.498	77.26
135.000	0.60	36.072	24.07	48.096	32.09	60.120	40.12	72.144	48.14	96.192	64.18	120.239	80.23
140.000	0.58	38.793	24.96	51.724	33.28	64.655	41.60	77.587	49.92	103.449	66.56	129.311	83.20
145.000	0.56	41.614	25.85	55.485	34.47	69.356	43.09	83.227	51.70	110.970	68.94	138.712	86.17
150.000	0.54	44.533	26.74	59.377	35.66	74.222	44.57	89.066	53.49	118.755	71.32	148.444	89.15
155.000	0.52	47.551	27.64	63.402	36.85	79.252	46.06	95.103	55.27	126.804	73.69	158.505	92.12
160.000	0.51	50.669	28.53	67.558	38.04	84.448	47.54	101.338	57.05	135.117	76.07	168.896	95.09
165.000	0.49	53.885	29.42	71.847	39.22	89.808	49.03	107.770	58.84	143.693	78.45	179.617	98.06
170.000	0.47	57.200	30.31	76.267	40.41	95.334	50.52	114.401	60.62	152.534	80.83	190.668	101.03
175.000	0.46	60.614	31.20	80.819	41.60	101.024	52.00	121.229	62.40	161.639	83.20	202.048	104.00
180.000	0.45	64.128	32.09	85.504	42.79	106.879	53.49	128.255	64.18	171.007	85.58	213.759	106.97
185.000	0.44	67.740	32.98	90.320	43.98	112.900	54.97	135.480	65.97	180.639	87.96	225.799	109.95
190.000	0.42	71.451	33.88	95.268	45.17	119.085	56.46	142.902	67.75	190.536	90.33	238.170	112.92
195.000	0.41	75.261	34.77	100.348	46.36	125.435	57.94	150.522	69.53	200.696	92.71	250.870	115.89
200.000	0.40	79.170	35.66	105.560	47.54	131.950	59.43	158.340	71.32	211.120	95.09	263.900	118.86

TABEL 7

HITUNGAN BETON DENGAN KOMPUTER * DIPROGRAM OLEH IR. MORISCO * BETON K225. *BAJA U22.BEBAN 1

H	A2	B = 15 CM		B = 20 CM		B = 25 CM		B = 30 CM		B = 40 CM		B = 50 CM	
		M1	A1	M1	A1	M1	A1	M1	A1	M1	A1	M1	A1
15.000	7.84	0.573	3.44	0.763	4.58	0.954	5.73	1.145	6.88	1.527	9.17	1.909	11.46
20.000	5.22	1.018	4.58	1.357	6.11	1.696	7.64	2.036	9.17	2.714	12.23	3.393	15.28
25.000	3.92	1.590	5.73	2.121	7.64	2.651	9.55	3.181	11.46	4.241	15.28	5.302	19.10
30.000	3.13	2.290	6.88	3.054	9.17	3.817	11.46	4.581	13.75	6.107	18.34	7.634	22.92
35.000	2.61	3.117	8.02	4.156	10.70	5.196	13.37	6.235	16.05	8.313	21.39	10.391	26.74
40.000	2.24	4.072	9.17	5.429	12.23	6.786	15.28	8.143	18.34	10.858	24.45	13.572	30.56
45.000	1.96	5.153	10.32	6.871	13.75	8.589	17.19	10.306	20.63	13.742	27.51	17.177	34.38
50.000	1.74	6.362	11.46	8.482	15.28	10.603	19.10	12.724	22.92	16.965	30.56	21.206	38.21
55.000	1.57	7.698	12.61	10.264	16.81	12.830	21.01	15.396	25.22	20.528	33.62	25.660	42.03
60.000	1.42	9.161	13.75	12.215	18.34	15.268	22.92	18.322	27.51	24.430	36.68	30.537	45.85
65.000	1.31	10.752	14.90	14.335	19.87	17.919	24.83	21.503	29.80	28.671	39.73	35.839	49.67
70.000	1.21	12.469	16.05	16.626	21.39	20.782	26.74	24.939	32.09	33.251	42.79	41.564	53.49
75.000	1.12	14.314	17.19	19.086	22.92	23.857	28.65	28.628	34.38	38.171	45.85	47.714	57.31
80.000	1.04	16.286	18.34	21.715	24.45	27.144	30.56	32.573	36.68	43.430	48.90	54.288	61.13
85.000	0.98	18.386	19.48	24.514	25.98	30.643	32.47	36.772	38.97	49.029	51.96	61.286	64.95
90.000	0.92	20.612	20.63	27.483	27.51	34.354	34.38	41.225	41.26	54.967	55.02	68.708	68.77
95.000	0.87	22.966	21.78	30.622	29.04	38.277	36.30	45.933	43.55	61.244	58.07	76.555	72.59
100.000	0.82	25.447	22.92	33.930	30.56	42.412	38.21	50.895	45.85	67.860	61.13	84.825	76.41
105.000	0.78	28.056	24.07	37.408	32.09	46.760	40.12	56.112	48.14	74.816	64.18	93.520	80.23
110.000	0.75	30.791	25.22	41.055	33.62	51.319	42.03	61.583	50.43	82.111	67.24	102.638	84.05
115.000	0.71	33.654	26.36	44.872	35.15	56.090	43.94	67.309	52.72	89.745	70.30	112.181	87.87
120.000	0.68	36.644	27.51	48.859	36.68	61.074	45.85	73.289	55.02	97.718	73.35	122.148	91.69
125.000	0.65	39.762	28.65	53.016	38.21	66.269	47.76	79.523	57.31	106.031	76.41	132.539	95.51
130.000	0.63	43.006	29.80	57.342	39.73	71.677	49.67	86.013	59.60	114.683	79.47	143.354	99.33
135.000	0.60	46.378	30.95	61.837	41.26	77.297	51.58	92.756	61.89	123.675	82.52	154.593	103.15
140.000	0.58	49.877	32.09	66.503	42.79	83.128	53.49	99.754	64.18	133.006	85.58	166.257	106.97
145.000	0.56	53.503	33.24	71.338	44.32	89.172	55.40	107.007	66.48	142.676	88.64	178.344	110.80
150.000	0.54	57.257	34.38	76.342	45.85	95.428	57.31	114.514	68.77	152.685	91.69	190.856	114.62
155.000	0.52	61.138	35.53	81.517	47.37	101.896	59.22	122.275	71.06	163.033	94.75	203.792	118.44
160.000	0.51	65.146	36.68	86.861	48.90	108.576	61.13	130.291	73.35	173.721	97.81	217.152	122.26
165.000	0.49	69.281	37.82	92.374	50.43	115.468	63.04	138.562	75.65	184.749	100.86	230.936	126.08
170.000	0.47	73.543	38.97	98.058	51.96	122.572	64.95	147.087	77.94	196.115	103.92	245.144	129.90
175.000	0.46	77.933	40.12	103.911	53.49	129.888	66.86	155.866	80.23	207.821	106.97	259.776	133.72
180.000	0.45	82.450	41.26	109.933	55.02	137.416	68.77	164.900	82.52	219.866	110.03	274.833	137.54
185.000	0.44	87.094	42.41	116.125	56.54	145.157	70.68	174.188	84.82	232.251	113.09	290.313	141.36
190.000	0.42	91.865	43.55	122.487	58.07	153.109	72.59	183.731	87.11	244.975	116.14	306.218	145.18
195.000	0.41	96.764	44.70	129.019	59.60	161.273	74.50	193.528	89.40	258.037	119.20	322.547	149.00
200.000	0.40	101.790	45.85	135.720	61.13	169.650	76.41	203.580	91.69	271.440	122.26	339.300	152.82

TABEL 8

HITUNGAN BETON DENGAN KOMPUTER * DIPROGRAM OLEH IR. MORISCO * BETON K100. *BAJA U24.BEBAN 2

H	A2	B = 15 CM		B = 20 CM		B = 25 CM		B = 30 CM		B = 40 CM		B = 50 CM	
		M1	A1	M1	A1	M1	A1	M1	A1	M1	A1	M1	A1
15.000	5.03	0.364	1.40	0.485	1.87	0.606	2.33	0.727	2.80	0.969	3.74	1.212	4.67
20.000	3.35	0.646	1.87	0.862	2.49	1.077	3.11	1.293	3.74	1.723	4.98	2.154	6.23
25.000	2.51	1.010	2.33	1.346	3.11	1.683	3.89	2.020	4.67	2.693	6.23	3.366	7.78
30.000	2.01	1.454	2.80	1.939	3.74	2.424	4.67	2.908	5.60	3.878	7.47	4.847	9.34
35.000	1.68	1.979	3.27	2.639	4.36	3.299	5.45	3.958	6.54	5.278	8.72	6.597	10.90
40.000	1.44	2.585	3.74	3.447	4.98	4.309	6.23	5.170	7.47	6.894	9.96	8.617	12.45
45.000	1.26	3.272	4.20	4.362	5.60	5.453	7.00	6.544	8.41	8.725	11.21	10.906	14.01
50.000	1.12	4.039	4.67	5.386	6.23	6.732	7.78	8.079	9.34	10.771	12.45	13.464	15.57
55.000	1.01	4.888	5.14	6.517	6.85	8.146	8.56	9.775	10.27	13.033	13.70	16.292	17.12
60.000	0.91	5.817	5.60	7.755	7.47	9.694	9.34	11.633	11.21	15.511	14.94	19.389	18.68
65.000	0.84	6.826	6.07	9.102	8.09	11.377	10.12	13.653	12.14	18.204	16.19	22.755	20.23
70.000	0.77	7.917	6.54	10.556	8.72	13.195	10.90	15.834	13.07	21.112	17.43	26.390	21.79
75.000	0.72	9.088	7.00	12.118	9.34	15.147	11.67	18.177	14.01	24.236	18.68	30.295	23.35
80.000	0.67	10.341	7.47	13.787	9.96	17.234	12.45	20.681	14.94	27.575	19.92	34.469	24.90
85.000	0.63	11.674	7.94	15.565	10.58	19.456	13.23	23.347	15.88	31.129	21.17	38.912	26.46
90.000	0.59	13.087	8.41	17.450	11.21	21.812	14.01	26.175	16.81	34.899	22.41	43.624	28.02
95.000	0.56	14.582	8.87	19.442	11.83	24.303	14.79	29.164	17.74	38.885	23.66	48.606	29.57
100.000	0.53	16.157	9.34	21.543	12.45	26.929	15.57	32.314	18.68	43.086	24.90	53.857	31.13
105.000	0.50	17.813	9.81	23.751	13.07	29.689	16.34	35.626	19.61	47.502	26.15	59.377	32.69
110.000	0.48	19.550	10.27	26.067	13.70	32.584	17.12	39.100	20.55	52.134	27.39	65.167	34.24
115.000	0.46	21.368	10.74	28.490	14.32	35.613	17.90	42.736	21.48	56.981	28.64	71.226	35.80
120.000	0.44	23.266	11.21	31.022	14.94	38.777	18.68	46.533	22.41	62.043	29.89	77.554	37.36
125.000	0.42	25.246	11.67	33.661	15.57	42.076	19.46	50.491	23.35	67.321	31.13	84.152	38.91
130.000	0.40	27.306	12.14	36.407	16.19	45.509	20.23	54.611	24.28	72.815	32.38	91.019	40.47
135.000	0.39	29.446	12.61	39.262	16.81	49.077	21.01	58.893	25.22	78.524	33.62	98.155	42.03
140.000	0.37	31.668	13.07	42.224	17.43	52.780	21.79	63.336	26.15	84.448	34.87	105.560	43.58
145.000	0.36	33.970	13.54	45.294	18.06	56.617	22.57	67.941	27.08	90.588	36.11	113.235	45.14
150.000	0.35	36.354	14.01	48.471	18.68	60.589	23.35	72.707	28.02	96.943	37.36	121.179	46.70
155.000	0.34	38.818	14.48	51.757	19.30	64.696	24.13	77.635	28.95	103.513	38.60	129.392	48.25
160.000	0.32	41.362	14.94	55.150	19.92	68.937	24.90	82.725	29.89	110.299	39.85	137.874	49.81
165.000	0.31	43.988	15.41	58.650	20.55	73.313	25.68	87.976	30.82	117.301	41.09	146.626	51.36
170.000	0.30	46.694	15.88	62.259	21.17	77.823	26.46	93.388	31.75	124.518	42.34	155.647	52.92
175.000	0.30	49.481	16.34	65.975	21.79	82.469	27.24	98.962	32.69	131.950	43.58	164.937	54.48
180.000	0.29	52.349	16.81	69.799	22.41	87.248	28.02	104.698	33.62	139.598	44.83	174.497	56.03
185.000	0.28	55.298	17.28	73.730	23.04	92.163	28.80	110.596	34.55	147.461	46.07	184.326	57.59
190.000	0.27	58.327	17.74	77.770	23.66	97.212	29.57	116.654	35.49	155.539	47.32	194.424	59.15
195.000	0.26	61.438	18.21	81.917	24.28	102.396	30.35	122.875	36.42	163.833	48.56	204.792	60.70
200.000	0.26	64.629	18.68	86.171	24.90	107.714	31.13	129.257	37.36	172.343	49.81	215.428	62.26

TABEL 9

HITUNGAN BETON DENGAN KOMPUTER * DIPROGRAM OLEH IR. MORISCO * BETON K125. *BAJA U24.BEBAN 2

H	A2	B = 15 CM		B = 20 CM		B = 25 CM		B = 30 CM		B = 40 CM		B = 50 CM	
		M1	A1	M1	A1	M1	A1	M1	A1	M1	A1	M1	A1
15.000	5.03	0.454	1.75	0.606	2.33	0.757	2.92	0.909	3.50	1.212	4.67	1.515	5.84
20.000	3.35	0.808	2.33	1.077	3.11	1.346	3.89	1.616	4.67	2.154	6.23	2.693	7.78
25.000	2.51	1.262	2.92	1.683	3.89	2.104	4.86	2.525	5.84	3.366	7.78	4.208	9.73
30.000	2.01	1.818	3.50	2.424	4.67	3.029	5.84	3.635	7.00	4.847	9.34	6.059	11.67
35.000	1.68	2.474	4.09	3.299	5.45	4.123	6.81	4.948	8.17	6.597	10.90	8.247	13.62
40.000	1.44	3.231	4.67	4.309	6.23	5.386	7.78	6.463	9.34	8.617	12.45	10.771	15.57
45.000	1.26	4.090	5.25	5.453	7.00	6.816	8.76	8.180	10.51	10.906	14.01	13.633	17.51
50.000	1.12	5.049	5.84	6.732	7.78	8.415	9.73	10.098	11.67	13.464	15.57	16.830	19.46
55.000	1.01	6.109	6.42	8.146	8.56	10.182	10.70	12.219	12.84	16.292	17.12	20.365	21.40
60.000	0.91	7.271	7.00	9.694	9.34	12.118	11.67	14.541	14.01	19.389	18.68	24.236	23.35
65.000	0.84	8.533	7.59	11.377	10.12	14.222	12.65	17.066	15.18	22.755	20.23	28.443	25.29
70.000	0.77	9.896	8.17	13.195	10.90	16.494	13.62	19.792	16.34	26.390	21.79	32.987	27.24
75.000	0.72	11.360	8.76	15.147	11.67	18.934	14.59	22.721	17.51	30.295	23.35	37.868	29.18
80.000	0.67	12.926	9.34	17.234	12.45	21.543	15.57	25.851	18.68	34.469	24.90	43.086	31.13
85.000	0.63	14.592	9.92	19.456	13.23	24.320	16.54	29.184	19.85	38.912	26.46	48.640	33.08
90.000	0.59	16.359	10.51	21.812	14.01	27.265	17.51	32.718	21.01	43.624	28.02	54.530	35.02
95.000	0.56	18.227	11.09	24.303	14.79	30.379	18.48	36.455	22.18	48.606	29.57	60.758	36.97
100.000	0.53	20.196	11.67	26.929	15.57	33.661	19.46	40.393	23.35	53.857	31.13	67.321	38.91
105.000	0.50	22.267	12.26	29.689	16.34	37.111	20.43	44.533	24.52	59.377	32.69	74.222	40.86
110.000	0.48	24.438	12.84	32.584	17.12	40.729	21.40	48.875	25.68	65.167	34.24	81.459	42.80
115.000	0.46	26.710	13.42	35.613	17.90	44.516	22.37	53.420	26.85	71.226	35.80	89.033	44.75
120.000	0.44	29.083	14.01	38.777	18.68	48.471	23.35	58.166	28.02	77.554	37.36	96.943	46.70
125.000	0.42	31.557	14.59	42.076	19.46	52.595	24.32	63.114	29.18	84.152	38.91	105.190	48.64
130.000	0.40	34.132	15.18	45.509	20.23	56.887	25.29	68.264	30.35	91.019	40.47	113.773	50.59
135.000	0.39	36.808	15.76	49.077	21.01	61.347	26.27	73.616	31.52	98.155	42.03	122.693	52.53
140.000	0.37	39.585	16.34	52.780	21.79	65.975	27.24	79.170	32.69	105.560	43.58	131.950	54.48
145.000	0.36	42.463	16.93	56.617	22.57	70.772	28.21	84.926	33.85	113.235	45.14	141.543	56.42
150.000	0.35	45.442	17.51	60.589	23.35	75.737	29.18	90.884	35.02	121.179	46.70	151.473	58.37
155.000	0.34	48.522	18.09	64.696	24.13	80.870	30.16	97.044	36.19	129.392	48.25	161.740	60.31
160.000	0.32	51.703	18.68	68.937	24.90	86.171	31.13	103.406	37.36	137.874	49.81	172.343	62.26
165.000	0.31	54.985	19.26	73.313	25.68	91.641	32.10	109.969	38.52	146.626	51.36	183.282	64.21
170.000	0.30	58.368	19.85	77.823	26.46	97.279	33.08	116.735	39.69	155.647	52.92	194.559	66.15
175.000	0.30	61.852	20.43	82.469	27.24	103.086	34.05	123.703	40.86	164.937	54.48	206.172	68.10
180.000	0.29	65.436	21.01	87.248	28.02	109.061	35.02	130.873	42.03	174.497	56.03	218.121	70.04
185.000	0.28	69.122	21.60	92.163	28.80	115.204	35.99	138.244	43.19	184.326	57.59	230.407	71.99
190.000	0.27	72.909	22.18	97.212	29.57	121.515	36.97	145.818	44.36	194.424	59.15	243.030	73.93
195.000	0.26	76.797	22.76	102.396	30.35	127.995	37.94	153.594	45.53	204.792	60.70	255.990	75.88
200.000	0.26	80.786	23.35	107.714	31.13	134.643	38.91	161.571	46.70	215.428	62.26	269.285	77.83

TABEL 10

HITUNGAN BETON DENGAN KOMPUTER * DIPROGRAM OLEH IR. MORISCO * BETON K175. *BAJA U24.BEBAN 2

H	A2	B = 15 CM		B = 20 CM		B = 25 CM		B = 30 CM		B = 40 CM		B = 50 CM	
		M1	A1	M1	A1	M1	A1	M1	A1	M1	A1	M1	A1
15.000	5.03	0.636	2.45	0.848	3.27	1.060	4.09	1.272	4.90	1.696	6.54	2.121	8.17
20.000	3.35	1.131	3.27	1.508	4.36	1.885	5.45	2.262	6.54	3.016	8.72	3.770	10.90
25.000	2.51	1.767	4.09	2.356	5.45	2.945	6.81	3.534	8.17	4.712	10.90	5.891	13.62
30.000	2.01	2.545	4.90	3.393	6.54	4.241	8.17	5.089	9.81	6.786	13.07	8.482	16.34
35.000	1.68	3.464	5.72	4.618	7.63	5.773	9.53	6.927	11.44	9.236	15.25	11.546	19.07
40.000	1.44	4.524	6.54	6.032	8.72	7.540	10.90	9.048	13.07	12.064	17.43	15.080	21.79
45.000	1.26	5.726	7.35	7.634	9.81	9.543	12.26	11.451	14.71	15.268	19.61	19.086	24.52
50.000	1.12	7.069	8.17	9.425	10.90	11.781	13.62	14.137	16.34	18.850	21.79	23.562	27.24
55.000	1.01	8.553	8.99	11.404	11.99	14.255	14.98	17.106	17.98	22.808	23.97	28.511	29.96
60.000	0.91	10.179	9.81	13.572	13.07	16.965	16.34	20.358	19.61	27.144	26.15	33.930	32.69
65.000	0.84	11.946	10.62	15.928	14.16	19.910	17.71	23.892	21.25	31.856	28.33	39.821	35.41
70.000	0.77	13.855	11.44	18.473	15.25	23.091	19.07	27.709	22.88	36.946	30.51	46.182	38.13
75.000	0.72	15.905	12.26	21.206	16.34	26.508	20.43	31.809	24.52	42.412	32.69	53.016	40.86
80.000	0.67	18.096	13.07	24.128	17.43	30.160	21.79	36.192	26.15	48.256	34.87	60.320	43.58
85.000	0.63	20.429	13.89	27.238	18.52	34.048	23.15	40.857	27.78	54.476	37.04	68.096	46.31
90.000	0.59	22.903	14.71	30.537	19.61	38.171	24.52	45.805	29.42	61.074	39.22	76.342	49.03
95.000	0.56	25.518	15.53	34.024	20.70	42.530	25.88	51.036	31.05	68.048	41.40	85.061	51.75
100.000	0.53	28.275	16.34	37.700	21.79	47.125	27.24	56.550	32.69	75.400	43.58	94.250	54.48
105.000	0.50	31.173	17.16	41.564	22.88	51.955	28.60	62.346	34.32	83.128	45.76	103.911	57.20
110.000	0.48	34.213	17.98	45.617	23.97	57.021	29.96	68.425	35.96	91.234	47.94	114.042	59.93
115.000	0.46	37.394	18.79	49.858	25.06	62.323	31.32	74.787	37.59	99.716	50.12	124.646	62.65
120.000	0.44	40.716	19.61	54.288	26.15	67.860	32.69	81.432	39.22	108.576	52.30	135.720	65.37
125.000	0.42	44.180	20.43	58.906	27.24	73.633	34.05	88.359	40.86	117.812	54.48	147.266	68.10
130.000	0.40	47.785	21.25	63.713	28.33	79.641	35.41	95.569	42.49	127.426	56.66	159.282	70.82
135.000	0.39	51.531	22.06	68.708	29.42	85.885	36.77	103.062	44.13	137.416	58.84	171.771	73.55
140.000	0.37	55.419	22.88	73.892	30.51	92.365	38.13	110.838	45.76	147.784	61.02	184.730	76.27
145.000	0.36	59.448	23.70	79.264	31.60	99.080	39.50	118.896	47.40	158.528	63.19	198.160	78.99
150.000	0.35	63.619	24.52	84.825	32.69	106.031	40.86	127.237	49.03	169.650	65.37	212.062	81.72
155.000	0.34	67.931	25.33	90.574	33.78	113.218	42.22	135.861	50.66	181.148	67.55	226.436	84.44
160.000	0.32	72.384	26.15	96.512	34.87	120.640	43.58	144.768	52.30	193.024	69.73	241.280	87.16
165.000	0.31	76.979	26.97	102.638	35.96	128.298	44.94	153.957	53.93	205.276	71.91	256.595	89.89
170.000	0.30	81.715	27.78	108.953	37.04	136.191	46.31	163.429	55.57	217.906	74.09	272.382	92.61
175.000	0.30	86.592	28.60	115.456	38.13	144.320	47.67	173.184	57.20	230.912	76.27	288.640	95.34
180.000	0.29	91.611	29.42	122.148	39.22	152.685	49.03	183.222	58.84	244.296	78.45	305.370	98.06
185.000	0.28	96.771	30.24	129.028	40.31	161.285	50.39	193.542	60.47	258.056	80.63	322.570	100.78
190.000	0.27	102.073	31.05	136.097	41.40	170.121	51.75	204.145	62.10	272.194	82.81	340.242	103.51
195.000	0.26	107.516	31.87	143.354	42.49	179.193	53.12	215.031	63.74	286.708	84.99	358.385	106.23
200.000	0.26	113.100	32.69	150.800	43.58	188.500	54.48	226.200	65.37	301.600	87.16	377.000	108.96

TABEL 11

HITUNGAN BETON DENGAN KOMPUTER * DIPROGRAM OLEH IR. MORISCO * BETON K225. *BAJA U24.BEBAN 2

H	A2	B = 15 CM		B = 20 CM		B = 25 CM		B = 30 CM		B = 40 CM		B = 50 CM	
		M1	A1	M1	A1	M1	A1	M1	A1	M1	A1	M1	A1
15.000	5.03	0.818	3.15	1.091	4.20	1.363	5.25	1.636	6.30	2.181	8.41	2.727	10.51
20.000	3.35	1.454	4.20	1.939	5.60	2.424	7.00	2.908	8.41	3.878	11.21	4.847	14.01
25.000	2.51	2.272	5.25	3.029	7.00	3.787	8.76	4.544	10.51	6.059	14.01	7.574	17.51
30.000	2.01	3.272	6.30	4.362	8.41	5.453	10.51	6.544	12.61	8.725	16.81	10.906	21.01
35.000	1.68	4.453	7.35	5.938	9.81	7.422	12.26	8.907	14.71	11.875	19.61	14.844	24.52
40.000	1.44	5.817	8.41	7.755	11.21	9.694	14.01	11.633	16.81	15.511	22.41	19.389	28.02
45.000	1.26	7.362	9.46	9.815	12.61	12.269	15.76	14.723	18.91	19.631	25.22	24.539	31.52
50.000	1.12	9.088	10.51	12.118	14.01	15.147	17.51	18.177	21.01	24.236	28.02	30.295	35.02
55.000	1.01	10.997	11.56	14.663	15.41	18.328	19.26	21.994	23.11	29.325	30.82	36.656	38.52
60.000	0.91	13.087	12.61	17.450	16.81	21.812	21.01	26.175	25.22	34.899	33.62	43.624	42.03
65.000	0.84	15.359	13.66	20.479	18.21	25.599	22.76	30.719	27.32	40.958	36.42	51.198	45.53
70.000	0.77	17.813	14.71	23.751	19.61	29.689	24.52	35.626	29.42	47.502	39.22	59.377	49.03
75.000	0.72	20.449	15.76	27.265	21.01	34.081	26.27	40.898	31.52	54.530	42.03	68.163	52.53
80.000	0.67	23.266	16.81	31.022	22.41	38.777	28.02	46.533	33.62	62.043	44.83	77.554	56.03
85.000	0.63	26.265	17.86	35.021	23.81	43.776	29.77	52.531	35.72	70.041	47.63	87.551	59.54
90.000	0.59	29.446	18.91	39.262	25.22	49.077	31.52	58.893	37.82	78.524	50.43	98.155	63.04
95.000	0.56	32.809	19.96	43.745	26.62	54.682	33.27	65.618	39.92	87.491	53.23	109.364	66.54
100.000	0.53	36.354	21.01	48.471	28.02	60.589	35.02	72.707	42.03	96.943	56.03	121.179	70.04
105.000	0.50	40.080	22.06	53.440	29.42	66.800	36.77	80.160	44.13	106.879	58.84	133.599	73.55
110.000	0.48	43.988	23.11	58.650	30.82	73.313	38.52	87.976	46.23	117.301	61.64	146.626	77.05
115.000	0.46	48.078	24.16	64.103	32.22	80.129	40.27	96.155	48.33	128.207	64.44	160.259	80.55
120.000	0.44	52.349	25.22	69.799	33.62	87.249	42.03	104.698	50.43	139.598	67.24	174.497	84.05
125.000	0.42	56.802	26.27	75.737	35.02	94.671	43.78	113.605	52.53	151.473	70.04	189.341	87.55
130.000	0.40	61.438	27.32	81.917	36.42	102.396	45.53	122.875	54.63	163.833	72.84	204.792	91.06
135.000	0.39	66.254	28.37	88.339	37.82	110.424	47.28	132.509	56.73	176.678	75.65	220.848	94.56
140.000	0.37	71.253	29.42	95.004	39.22	118.755	49.03	142.506	58.84	190.008	78.45	237.510	98.06
145.000	0.36	76.433	30.47	101.911	40.62	127.389	50.78	152.867	60.94	203.822	81.25	254.778	101.56
150.000	0.35	81.796	31.52	109.061	42.03	136.326	52.53	163.591	63.04	218.121	84.05	272.651	105.06
155.000	0.34	87.339	32.57	116.453	43.43	145.566	54.28	174.679	65.14	232.905	86.85	291.131	108.57
160.000	0.32	93.065	33.62	124.087	44.83	155.108	56.03	186.130	67.24	248.174	89.66	310.217	112.07
165.000	0.31	98.973	34.67	131.963	46.23	164.954	57.79	197.945	69.34	263.927	92.46	329.908	115.57
170.000	0.30	105.062	35.72	140.082	47.63	175.103	59.54	210.124	71.44	280.165	95.26	350.206	119.07
175.000	0.30	111.333	36.77	148.444	49.03	185.555	61.29	222.665	73.55	296.887	98.06	371.109	122.58
180.000	0.29	117.786	37.82	157.047	50.43	196.309	63.04	235.571	75.65	314.094	100.86	392.618	126.08
185.000	0.28	124.420	38.87	165.893	51.83	207.367	64.79	248.840	77.75	331.787	103.66	414.733	129.58
190.000	0.27	131.236	39.92	174.982	53.23	218.727	66.54	262.473	79.85	349.963	106.47	437.454	133.08
195.000	0.26	138.234	40.98	184.312	54.63	230.391	68.29	276.469	81.95	368.625	109.27	460.781	136.58
200.000	0.26	145.414	42.03	193.886	56.03	242.357	70.04	290.828	84.05	387.771	112.07	484.714	140.09

TABEL 12

HITUNGAN BETON DENGAN KOMPUTER * DIPROGRAM OLEH IR. MORISCO * BETON K100. *BAJA U22.BEBAN 2

H	A2	B = 15 CM		B = 20 CM		B = 25 CM		B = 30 CM		B = 40 CM		B = 50 CM	
		M1	A1	M1	A1	M1	A1	M1	A1	M1	A1	M1	A1
15.000	5.49	0.364	1.53	0.485	2.04	0.606	2.55	0.727	3.06	0.969	4.08	1.212	5.09
20.000	3.66	0.646	2.04	0.862	2.72	1.077	3.40	1.293	4.08	1.723	5.43	2.154	6.79
25.000	2.74	1.010	2.55	1.346	3.40	1.683	4.25	2.020	5.09	2.693	6.79	3.366	8.49
30.000	2.19	1.454	3.06	1.939	4.08	2.424	5.09	2.908	6.11	3.878	8.15	4.847	10.19
35.000	1.83	1.979	3.57	2.639	4.75	3.299	5.94	3.958	7.13	5.278	9.51	6.597	11.89
40.000	1.57	2.585	4.08	3.447	5.43	4.309	6.79	5.170	8.15	6.894	10.87	8.617	13.58
45.000	1.37	3.272	4.58	4.362	6.11	5.453	7.64	6.544	9.17	8.725	12.23	10.906	15.28
50.000	1.22	4.039	5.09	5.386	6.79	6.732	8.49	8.079	10.19	10.771	13.58	13.464	16.98
55.000	1.10	4.888	5.60	6.517	7.47	8.146	9.34	9.775	11.21	13.033	14.94	16.292	18.68
60.000	1.00	5.817	6.11	7.755	8.15	9.694	10.19	11.633	12.23	15.511	16.30	19.389	20.38
65.000	0.91	6.826	6.62	9.102	8.83	11.377	11.04	13.653	13.24	18.204	17.66	22.755	22.07
70.000	0.84	7.917	7.13	10.556	9.51	13.195	11.89	15.834	14.26	21.112	19.02	26.390	23.77
75.000	0.78	9.088	7.64	12.118	10.19	15.147	12.74	18.177	15.28	24.236	20.38	30.295	25.47
80.000	0.73	10.341	8.15	13.787	10.87	17.234	13.58	20.681	16.30	27.575	21.73	34.469	27.17
85.000	0.69	11.674	8.66	15.565	11.55	19.456	14.43	23.347	17.32	31.129	23.09	38.912	28.87
90.000	0.65	13.087	9.17	17.450	12.23	21.812	15.28	26.175	18.34	34.899	24.45	43.624	30.56
95.000	0.61	14.582	9.68	19.442	12.90	24.303	16.13	29.164	19.36	38.885	25.81	48.606	32.26
100.000	0.58	16.157	10.19	21.543	13.58	26.929	16.98	32.314	20.38	43.086	27.17	53.857	33.96
105.000	0.55	17.813	10.70	23.751	14.26	29.689	17.83	35.626	21.39	47.502	28.53	59.377	35.66
110.000	0.52	19.550	11.21	26.067	14.94	32.584	18.68	39.100	22.41	52.134	29.89	65.167	37.36
115.000	0.50	21.368	11.72	28.490	15.62	35.613	19.53	42.736	23.43	56.981	31.24	71.226	39.05
120.000	0.48	23.266	12.23	31.022	16.30	38.777	20.38	46.533	24.45	62.043	32.60	77.554	40.75
125.000	0.46	25.246	12.74	33.661	16.98	42.076	21.23	50.491	25.47	67.321	33.96	84.152	42.45
130.000	0.44	27.306	13.24	36.407	17.66	45.509	22.07	54.611	26.49	72.815	35.32	91.019	44.15
135.000	0.42	29.446	13.75	39.262	18.34	49.077	22.92	58.893	27.51	78.524	36.68	98.155	45.85
140.000	0.41	31.668	14.26	42.224	19.02	52.780	23.77	63.336	28.53	84.448	38.04	105.560	47.54
145.000	0.39	33.970	14.77	45.294	19.70	56.617	24.62	67.941	29.55	90.588	39.39	113.235	49.24
150.000	0.38	36.354	15.28	48.471	20.38	60.589	25.47	72.707	30.56	96.943	40.75	121.179	50.94
155.000	0.37	38.818	15.79	51.757	21.06	64.696	26.32	77.635	31.58	103.513	42.11	129.392	52.64
160.000	0.35	41.362	16.30	55.150	21.73	68.937	27.17	82.725	32.60	110.299	43.47	137.874	54.34
165.000	0.34	43.988	16.81	58.650	22.41	73.313	28.02	87.976	33.62	117.301	44.83	146.626	56.03
170.000	0.33	46.694	17.32	62.259	23.09	77.823	28.87	93.388	34.64	124.518	46.19	155.647	57.73
175.000	0.32	49.481	17.83	65.975	23.77	82.469	29.72	98.962	35.66	131.950	47.54	164.937	59.43
180.000	0.31	52.349	18.34	69.799	24.45	87.248	30.56	104.698	36.68	139.598	48.90	174.497	61.13
185.000	0.30	55.298	18.85	73.730	25.13	92.163	31.41	110.596	37.70	147.461	50.26	184.326	62.83
190.000	0.30	58.327	19.36	77.770	25.81	97.212	32.26	116.654	38.71	155.539	51.62	194.424	64.52
195.000	0.29	61.438	19.87	81.917	26.49	102.396	33.11	122.875	39.73	163.833	52.98	204.792	66.22
200.000	0.28	64.629	20.38	86.171	27.17	107.714	33.96	129.257	40.75	172.343	54.34	215.428	67.92

TABEL 13

HITUNGAN BETON DENGAN KOMPUTER * DIPROGRAM OLEH IR. MORISCO * BETON K125. *BAJA U22.BEBAN 2

H	A2	B = 15 CM		B = 20 CM		B = 25 CM		B = 30 CM		B = 40 CM		B = 50 CM	
		M1	A1	M1	A1	M1	A1	M1	A1	M1	A1	M1	A1
15.000	5.49	0.454	1.91	0.606	2.55	0.757	3.18	0.909	3.82	1.212	5.09	1.515	6.37
20.000	3.66	0.808	2.55	1.077	3.40	1.346	4.25	1.616	5.09	2.154	6.79	2.693	8.49
25.000	2.74	1.262	3.18	1.683	4.25	2.104	5.31	2.525	6.37	3.366	8.49	4.208	10.61
30.000	2.19	1.818	3.82	2.424	5.09	3.029	6.37	3.635	7.64	4.847	10.19	6.059	12.74
35.000	1.83	2.474	4.46	3.299	5.94	4.123	7.43	4.948	8.91	6.597	11.89	8.247	14.86
40.000	1.57	3.231	5.09	4.309	6.79	5.386	8.49	6.463	10.19	8.617	13.58	10.771	16.98
45.000	1.37	4.090	5.73	5.453	7.64	6.816	9.55	8.180	11.46	10.906	15.28	13.633	19.10
50.000	1.22	5.049	6.37	6.732	8.49	8.415	10.61	10.098	12.74	13.464	16.98	16.830	21.23
55.000	1.10	6.109	7.00	8.146	9.34	10.182	11.67	12.219	14.01	16.292	18.68	20.365	23.35
60.000	1.00	7.271	7.64	9.694	10.19	12.118	12.74	14.541	15.28	19.389	20.38	24.236	25.47
65.000	0.91	8.533	8.28	11.377	11.04	14.222	13.80	17.066	16.56	22.755	22.07	28.443	27.59
70.000	0.84	9.896	8.91	13.195	11.89	16.494	14.86	19.792	17.83	26.390	23.77	32.987	29.72
75.000	0.78	11.360	9.55	15.147	12.74	18.934	15.92	22.721	19.10	30.295	25.47	37.868	31.84
80.000	0.73	12.926	10.19	17.234	13.58	21.543	16.98	25.851	20.38	34.469	27.17	43.086	33.96
85.000	0.69	14.592	10.82	19.456	14.43	24.320	18.04	29.184	21.65	38.912	28.87	48.640	36.08
90.000	0.65	16.359	11.46	21.812	15.28	27.265	19.10	32.718	22.92	43.624	30.56	54.530	38.21
95.000	0.61	18.227	12.10	24.303	16.13	30.379	20.16	36.455	24.20	48.606	32.26	60.758	40.33
100.000	0.58	20.196	12.74	26.929	16.98	33.661	21.23	40.393	25.47	53.857	33.96	67.321	42.45
105.000	0.55	22.267	13.37	29.689	17.83	37.111	22.29	44.533	26.74	59.377	35.66	74.222	44.57
110.000	0.52	24.438	14.01	32.584	18.68	40.729	23.35	48.875	28.02	65.167	37.36	81.459	46.70
115.000	0.50	26.710	14.65	35.613	19.53	44.516	24.41	53.420	29.29	71.226	39.05	89.033	48.82
120.000	0.48	29.083	15.28	38.777	20.38	48.471	25.47	58.166	30.56	77.554	40.75	96.943	50.94
125.000	0.46	31.557	15.92	42.076	21.23	52.595	26.53	63.114	31.84	84.152	42.45	105.190	53.06
130.000	0.44	34.132	16.56	45.509	22.07	56.887	27.59	68.264	33.11	91.019	44.15	113.773	55.19
135.000	0.42	36.808	17.19	49.077	22.92	61.347	28.65	73.616	34.38	98.155	45.85	122.693	57.31
140.000	0.41	39.585	17.83	52.780	23.77	65.975	29.72	79.170	35.66	105.560	47.54	131.950	59.43
145.000	0.39	42.463	18.47	56.617	24.62	70.772	30.78	84.926	36.93	113.235	49.24	141.543	61.55
150.000	0.38	45.442	19.10	60.589	25.47	75.737	31.84	90.884	38.21	121.179	50.94	151.473	63.68
155.000	0.37	48.522	19.74	64.696	26.32	80.870	32.90	97.044	39.48	129.392	52.64	161.740	65.80
160.000	0.35	51.703	20.38	68.937	27.17	86.171	33.96	103.406	40.75	137.874	54.34	172.343	67.92
165.000	0.34	54.985	21.01	73.313	28.02	91.641	35.02	109.969	42.03	146.626	56.03	183.282	70.04
170.000	0.33	58.368	21.65	77.823	28.87	97.279	36.08	116.735	43.30	155.647	57.73	194.559	72.17
175.000	0.32	61.852	22.29	82.469	29.72	103.086	37.14	123.703	44.57	164.937	59.43	206.172	74.29
180.000	0.31	65.436	22.92	87.248	30.56	109.061	38.21	130.873	45.85	174.497	61.13	218.121	76.41
185.000	0.30	69.122	23.56	92.163	31.41	115.204	39.27	138.244	47.12	184.326	62.83	230.407	78.53
190.000	0.30	72.909	24.20	97.212	32.26	121.515	40.33	145.818	48.39	194.424	64.52	243.030	80.66
195.000	0.29	76.797	24.83	102.396	33.11	127.995	41.39	153.594	49.67	204.792	66.22	255.990	82.78
200.000	0.28	80.786	25.47	107.714	33.96	134.643	42.45	161.571	50.94	215.428	67.92	269.285	84.90

TABEL 14

HITUNGAN BETON DENGAN KOMPUTER * DIPROGRAM OLEH IR. MORISCO * BETON K175. *BAJA U22.BEBAN 2

H	A2	B = 15 CM		B = 20 CM		B = 25 CM		B = 30 CM		B = 40 CM		B = 50 CM	
		M1	A1	M1	A1	M1	A1	M1	A1	M1	A1	M1	A1
15.000	5.49	0.636	2.67	0.848	3.57	1.060	4.46	1.272	5.35	1.696	7.13	2.121	8.91
20.000	3.66	1.131	3.57	1.508	4.75	1.885	5.94	2.262	7.13	3.016	9.51	3.770	11.89
25.000	2.74	1.767	4.46	2.356	5.94	2.945	7.43	3.534	8.91	4.712	11.89	5.891	14.86
30.000	2.19	2.545	5.35	3.393	7.13	4.241	8.91	5.089	10.70	6.786	14.26	8.482	17.83
35.000	1.83	3.464	6.24	4.618	8.32	5.773	10.40	6.927	12.48	9.236	16.64	11.546	20.80
40.000	1.57	4.524	7.13	6.032	9.51	7.540	11.89	9.048	14.26	12.064	19.02	15.080	23.77
45.000	1.37	5.726	8.02	7.634	10.70	9.543	13.37	11.451	16.05	15.268	21.39	19.086	26.74
50.000	1.22	7.069	8.91	9.425	11.89	11.781	14.86	14.137	17.83	18.850	23.77	23.562	29.72
55.000	1.10	8.553	9.81	11.404	13.07	14.255	16.34	17.106	19.61	22.808	26.15	28.511	32.69
60.000	1.00	10.179	10.70	13.572	14.26	16.965	17.83	20.358	21.39	27.144	28.53	33.930	35.66
65.000	0.91	11.946	11.59	15.928	15.45	19.910	19.31	23.892	23.18	31.856	30.90	39.821	38.63
70.000	0.84	13.855	12.48	18.473	16.64	23.091	20.80	27.709	24.96	36.946	33.28	46.182	41.60
75.000	0.78	15.905	13.37	21.206	17.83	26.508	22.29	31.809	26.74	42.412	35.66	53.016	44.57
80.000	0.73	18.096	14.26	24.128	19.02	30.160	23.77	36.192	28.53	48.256	38.04	60.320	47.54
85.000	0.69	20.429	15.15	27.238	20.21	34.048	25.26	40.857	30.31	54.476	40.41	68.096	50.52
90.000	0.65	22.903	16.05	30.537	21.39	38.171	26.74	45.805	32.09	61.074	42.79	76.342	53.49
95.000	0.61	25.518	16.94	34.024	22.58	42.530	28.23	51.036	33.88	68.048	45.17	85.061	56.46
100.000	0.58	28.275	17.83	37.700	23.77	47.125	29.72	56.550	35.66	75.400	47.54	94.250	59.43
105.000	0.55	31.173	18.72	41.564	24.96	51.955	31.20	62.346	37.44	83.128	49.92	103.911	62.40
110.000	0.52	34.213	19.61	45.617	26.15	57.021	32.69	68.425	39.22	91.234	52.30	114.042	65.37
115.000	0.50	37.394	20.50	49.858	27.34	62.323	34.17	74.787	41.01	99.716	54.68	124.646	68.35
120.000	0.48	40.716	21.39	54.288	28.53	67.860	35.66	81.432	42.79	108.576	57.05	135.720	71.32
125.000	0.46	44.180	22.29	58.906	29.72	73.633	37.14	88.359	44.57	117.812	59.43	147.266	74.29
130.000	0.44	47.785	23.18	63.713	30.90	79.641	38.63	95.569	46.36	127.426	61.81	159.282	77.26
135.000	0.42	51.531	24.07	68.708	32.09	85.885	40.12	103.062	48.14	137.416	64.18	171.771	80.23
140.000	0.41	55.419	24.96	73.892	33.28	92.365	41.60	110.838	49.92	147.784	66.56	184.730	83.20
145.000	0.39	59.448	25.85	79.264	34.47	99.080	43.09	118.896	51.70	158.528	68.94	198.160	86.17
150.000	0.38	63.619	26.74	84.825	35.66	106.031	44.57	127.237	53.49	169.650	71.32	212.062	89.15
155.000	0.37	67.931	27.64	90.574	36.85	113.218	46.06	135.861	55.27	181.148	73.69	226.436	92.12
160.000	0.35	72.384	28.53	96.512	38.04	120.640	47.54	144.768	57.05	193.024	76.07	241.280	95.09
165.000	0.34	76.979	29.42	102.638	39.22	128.298	49.03	153.957	58.84	205.276	78.45	256.595	98.06
170.000	0.33	81.715	30.31	108.953	40.41	136.191	50.52	163.429	60.62	217.906	80.83	272.382	101.03
175.000	0.32	86.592	31.20	115.456	41.60	144.320	52.00	173.184	62.40	230.912	83.20	288.640	104.00
180.000	0.31	91.611	32.09	122.148	42.79	152.685	53.49	183.222	64.18	244.296	85.58	305.370	106.97
185.000	0.30	96.771	32.98	129.028	43.98	161.285	54.97	193.542	65.97	258.056	87.96	322.570	109.95
190.000	0.30	102.073	33.88	136.097	45.17	170.121	56.46	204.145	67.75	272.194	90.33	340.242	112.92
195.000	0.29	107.516	34.77	143.354	46.36	179.193	57.94	215.031	69.53	286.708	92.71	358.385	115.89
200.000	0.28	113.100	35.66	150.800	47.54	188.500	59.43	226.200	71.32	301.600	95.09	377.000	118.86

TABEL 15

HITUNGAN BETON DENGAN KOMPUTER * DIPROGRAM OLEH IR. MORISCO * BETON K225. *BAJA U22.BEBAN 2

H	A2	B = 15 CM		B = 20 CM		B = 25 CM		B = 30 CM		B = 40 CM		B = 50 CM	
		M1	A1	M1	A1	M1	A1	M1	A1	M1	A1	M1	A1
15.000	5.49	0.818	3.44	1.091	4.58	1.363	5.73	1.636	6.88	2.181	9.17	2.727	11.46
20.000	3.66	1.454	4.58	1.939	6.11	2.424	7.64	2.908	9.17	3.878	12.23	4.847	15.28
25.000	2.74	2.272	5.73	3.029	7.64	3.787	9.55	4.544	11.46	6.059	15.28	7.574	19.10
30.000	2.19	3.272	6.88	4.362	9.17	5.453	11.46	6.544	13.75	8.725	18.34	10.906	22.92
35.000	1.83	4.453	8.02	5.938	10.70	7.422	13.37	8.907	16.05	11.875	21.39	14.844	26.74
40.000	1.57	5.817	9.17	7.755	12.23	9.694	15.28	11.633	18.34	15.511	24.45	19.389	30.56
45.000	1.37	7.362	10.32	9.815	13.75	12.269	17.19	14.723	20.63	19.631	27.51	24.539	34.38
50.000	1.22	9.088	11.46	12.118	15.28	15.147	19.10	18.177	22.92	24.236	30.56	30.295	38.21
55.000	1.10	10.997	12.61	14.663	16.81	18.328	21.01	21.994	25.22	29.325	33.62	36.656	42.03
60.000	1.00	13.087	13.75	17.450	18.34	21.812	22.92	26.175	27.51	34.899	36.68	43.624	45.85
65.000	0.91	15.359	14.90	20.479	19.87	25.599	24.83	30.719	29.80	40.958	39.73	51.198	49.67
70.000	0.84	17.813	16.05	23.751	21.39	29.689	26.74	35.626	32.09	47.502	42.79	59.377	53.49
75.000	0.78	20.449	17.19	27.265	22.92	34.081	28.65	40.898	34.38	54.530	45.85	68.163	57.31
80.000	0.73	23.266	18.34	31.022	24.45	38.777	30.56	46.533	36.68	62.043	48.90	77.554	61.13
85.000	0.69	26.265	19.48	35.021	25.98	43.776	32.47	52.531	38.97	70.041	51.96	87.551	64.95
90.000	0.65	29.446	20.63	39.262	27.51	49.077	34.38	58.893	41.26	78.524	55.02	98.155	68.77
95.000	0.61	32.809	21.78	43.745	29.04	54.682	36.30	65.618	43.55	87.491	58.07	109.364	72.59
100.000	0.58	36.354	22.92	48.471	30.56	60.589	38.21	72.707	45.85	96.943	61.13	121.179	76.41
105.000	0.55	40.080	24.07	53.440	32.09	66.800	40.12	80.160	48.14	106.879	64.18	133.599	80.23
110.000	0.52	43.988	25.22	58.650	33.62	73.313	42.03	87.976	50.43	117.301	67.24	146.626	84.05
115.000	0.50	48.078	26.36	64.103	35.15	80.129	43.94	96.155	52.72	128.207	70.30	160.259	87.87
120.000	0.48	52.349	27.51	69.799	36.68	87.249	45.85	104.698	55.02	139.598	73.35	174.497	91.69
125.000	0.46	56.802	28.65	75.737	38.21	94.671	47.76	113.605	57.31	151.473	76.41	189.341	95.51
130.000	0.44	61.438	29.80	81.917	39.73	102.396	49.67	122.875	59.60	163.833	79.47	204.792	99.33
135.000	0.42	66.254	30.95	88.339	41.26	110.424	51.58	132.509	61.89	176.678	82.52	220.848	103.15
140.000	0.41	71.253	32.09	95.004	42.79	118.755	53.49	142.506	64.18	190.008	85.58	237.510	106.97
145.000	0.39	76.433	33.24	101.911	44.32	127.389	55.40	152.867	66.48	203.822	88.64	254.778	110.80
150.000	0.38	81.796	34.38	109.061	45.85	136.326	57.31	163.591	68.77	218.121	91.69	272.651	114.62
155.000	0.37	87.339	35.53	116.453	47.37	145.566	59.22	174.679	71.06	232.905	94.75	291.131	118.44
160.000	0.35	93.065	36.68	124.087	48.90	155.108	61.13	186.130	73.35	248.174	97.81	310.217	122.26
165.000	0.34	98.973	37.82	131.963	50.43	164.954	63.04	197.945	75.65	263.927	100.86	329.908	126.08
170.000	0.33	105.062	38.97	140.082	51.96	175.103	64.95	210.124	77.94	280.165	103.92	350.206	129.90
175.000	0.32	111.333	40.12	148.444	53.49	185.555	66.86	222.665	80.23	296.887	106.97	371.109	133.72
180.000	0.31	117.786	41.26	157.047	55.02	196.309	68.77	235.571	82.52	314.094	110.03	392.618	137.54
185.000	0.30	124.420	42.41	165.893	56.54	207.367	70.68	248.840	84.82	331.787	113.09	414.733	141.36
190.000	0.30	131.236	43.55	174.982	58.07	218.727	72.59	262.473	87.11	349.963	116.14	437.454	145.18
195.000	0.29	138.234	44.70	184.312	59.60	230.391	74.50	276.469	89.40	368.625	119.20	460.781	149.00
200.000	0.28	145.414	45.85	193.886	61.13	242.357	76.41	290.828	91.69	387.771	122.26	484.714	152.82

TABEL 16

HITUNGAN PLAT BETON SELEBAR 100 CM

H	BETON K125 M	A (CM2)		BETON K175 M	A (CM2)		BETON K225 M	A (CM2)	
(CM.)	(TM.)	U-22	U-24	(TM.)	U-22	U-24	(TM.)	U-22	U-24
5.000	0.236	4.245	3.891	0.330	5.943	5.448	0.424	7.641	7.004
5.500	0.285	4.670	4.280	0.399	6.537	5.993	0.513	8.405	7.705
6.000	0.339	5.094	4.670	0.475	7.132	6.537	0.611	9.169	8.405
6.500	0.398	5.519	5.059	0.557	7.726	7.082	0.717	9.933	9.106
7.000	0.462	5.943	5.448	0.647	8.320	7.627	0.831	10.697	9.806
7.500	0.530	6.368	5.837	0.742	8.915	8.172	0.954	11.462	10.506
8.000	0.603	6.792	6.226	0.844	9.509	8.716	1.086	12.226	11.207
8.500	0.681	7.217	6.615	0.953	10.103	9.261	1.226	12.990	11.907
9.000	0.763	7.641	7.004	1.069	10.697	9.806	1.374	13.754	12.608
9.500	0.851	8.066	7.393	1.191	11.292	10.351	1.531	14.518	13.308
10.000	0.942	8.490	7.783	1.319	11.886	10.896	1.696	15.282	14.009
10.500	1.039	8.915	8.172	1.455	12.480	11.440	1.870	16.046	14.709
11.000	1.140	9.339	8.561	1.597	13.075	11.985	2.053	16.810	15.409
11.500	1.246	9.764	8.950	1.745	13.669	12.530	2.244	17.574	16.110
12.000	1.357	10.188	9.339	1.900	14.263	13.075	2.443	18.339	16.810
12.500	1.473	10.613	9.728	2.062	14.858	13.619	2.651	19.103	17.511
13.000	1.593	11.037	10.117	2.230	15.452	14.164	2.867	19.867	18.211
13.500	1.718	11.462	10.506	2.405	16.046	14.709	3.092	20.631	18.912
14.000	1.847	11.886	10.896	2.586	16.641	15.254	3.325	21.395	19.612
14.500	1.982	12.311	11.285	2.774	17.235	15.799	3.567	22.159	20.313
15.000	2.121	12.735	11.674	2.969	17.829	16.343	3.817	22.923	21.013
15.500	2.264	13.160	12.063	3.170	18.423	16.888	4.076	23.687	21.713
16.000	2.413	13.584	12.452	3.378	19.018	17.433	4.343	24.451	22.414
16.500	2.566	14.009	12.841	3.592	19.612	17.978	4.619	25.216	23.114
17.000	2.724	14.433	13.230	3.813	20.206	18.523	4.903	25.980	23.815
17.500	2.886	14.858	13.619	4.041	20.801	19.067	5.196	26.744	24.515
18.000	3.054	15.282	14.009	4.275	21.395	19.612	5.497	27.508	25.216
18.500	3.226	15.707	14.398	4.516	21.989	20.157	5.806	28.272	25.916
19.000	3.402	16.131	14.787	4.763	22.584	20.702	6.124	29.036	26.616
19.500	3.584	16.556	15.176	5.017	23.178	21.246	6.451	29.800	27.317
20.000	3.770	16.980	15.565	5.278	23.772	21.791	6.786	30.564	28.017

TABEL 17

LUAS PENAMPANG TULANGAN

DALAM CM PERSEGI

DIAMETER (MM)	JUMLAH TULANGAN 1	2	3	4	5	6	7	8	9	10	DIAMETER (MM)
5.	0.20	0.39	0.59	0.79	0.98	1.18	1.37	1.57	1.77	1.96	5.
6.	0.28	0.57	0.85	1.13	1.41	1.70	1.98	2.26	2.54	2.83	6.
7.	0.38	0.77	1.15	1.54	1.92	2.31	2.69	3.08	3.46	3.85	7.
8.	0.50	1.01	1.51	2.01	2.51	3.02	3.52	4.02	4.52	5.03	8.
9.	0.64	1.27	1.91	2.54	3.18	3.82	4.45	5.09	5.73	6.36	9.
10.	0.79	1.57	2.36	3.14	3.93	4.71	5.50	6.28	7.07	7.85	10.
11.	0.95	1.90	2.85	3.80	4.75	5.70	6.65	7.60	8.55	9.50	11.
12.	1.13	2.26	3.39	4.52	5.65	6.79	7.92	9.05	10.18	11.31	12.
13.	1.33	2.65	3.98	5.31	6.64	7.96	9.29	10.62	11.95	13.27	13.
14.	1.54	3.08	4.62	6.16	7.70	9.24	10.78	12.32	13.85	15.39	14.
15.	1.77	3.53	5.30	7.07	8.84	10.60	12.37	14.14	15.90	17.67	15.
16.	2.01	4.02	6.03	8.04	10.05	12.06	14.07	16.08	18.10	20.11	16.
17.	2.27	4.54	6.81	9.08	11.35	13.62	15.89	18.16	20.43	22.70	17.
18.	2.54	5.09	7.63	10.18	12.72	15.27	17.81	20.36	22.90	25.45	18.
19.	2.84	5.67	8.51	11.34	14.18	17.01	19.85	22.68	25.52	28.35	19.
20.	3.14	6.28	9.42	12.57	15.71	18.85	21.99	25.13	28.27	31.42	20.
21.	3.46	6.93	10.39	13.85	17.32	20.78	24.25	27.71	31.17	34.64	21.
22.	3.80	7.60	11.40	15.21	19.01	22.81	26.61	30.41	34.21	38.01	22.
23.	4.15	8.31	12.46	16.62	20.77	24.93	29.08	33.24	37.39	41.55	23.
24.	4.52	9.05	13.57	18.10	22.62	27.14	31.67	36.19	40.71	45.24	24.
25.	4.91	9.82	14.73	19.63	24.54	29.45	34.36	39.27	44.18	49.09	25.
26.	5.31	10.62	15.93	21.24	26.55	31.86	37.17	42.47	47.78	53.09	26.
27.	5.73	11.45	17.18	22.90	28.63	34.35	40.08	45.80	51.53	57.26	27.
28.	6.16	12.32	18.47	24.63	30.79	36.95	43.10	49.26	55.42	61.58	28.
29.	6.61	13.21	19.82	26.42	33.03	39.63	46.24	52.84	59.45	66.05	29.
30.	7.07	14.14	21.21	28.27	35.34	42.41	49.48	56.55	63.62	70.69	30.
31.	7.55	15.10	22.64	30.19	37.74	45.29	52.83	60.38	67.93	75.48	31.
32.	8.04	16.08	24.13	32.17	40.21	48.25	56.30	64.34	72.38	80.42	32.
33.	8.55	17.11	25.66	34.21	42.76	51.32	59.87	68.42	76.98	85.53	33.
34.	9.08	18.16	27.24	36.32	45.40	54.48	63.55	72.63	81.71	90.79	34.
35.	9.62	19.24	28.86	38.48	48.11	57.73	67.35	76.97	86.59	96.21	35.
36.	10.18	20.36	30.54	40.71	50.89	61.07	71.25	81.43	91.61	101.79	36.
37.	10.75	21.50	32.26	43.01	53.76	64.51	75.26	86.02	96.77	107.52	37.
38.	11.34	22.68	34.02	45.36	56.71	68.05	79.39	90.73	102.07	113.41	38.
39.	11.95	23.89	35.84	47.78	59.73	71.68	83.62	95.57	107.51	119.46	39.
40.	12.57	25.13	37.70	50.27	62.83	75.40	87.96	100.53	113.10	125.66	40.

TABEL 18

DAFTAR KEPUSTAKAAN

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